AN EVALUATION OF THE ELECTRONIC SERVICES OFFERED TO MASTER'S STUDENTS BY THE UNIVERSITY OF THE WESTERN CAPE ACADEMIC LIBRARY AS AN EFFORT TO BRIDGE THE DIGITAL DIVIDE

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A minor dissertation submitted in *partial fulfilment* of the requirements for the award of the degree of Master of Library and Information Studies

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2016

PLAGIARISM DECLARATION

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works, of other people has been attributed, and has been cited and referenced.

Lena Nyahodza 15-02-2016

Dedicated to my late mother, best friend and mentor, *Loice Sori Nyahodza*

Acknowledgements

I would like to express my sincere gratitude to:

My supervisor, Richard Higgs, for his commitment, guidance, support and encouragement, and to Associate Professor Jaya Raju for being always supportive and for nominating me for an NRF grant-holder bursary, which supported the study during data collection. I would not have made it without your joint support; and

Close friends and peers, Andiswa Mfengu, Jeremiah Pietersen, Dr Crystal Powell, Sipho Fako, Glynnis Johnson and Nazma Vajat for providing me with moral and academic support; Library and Information Studies Centre staff for all their academic support through research seminars; my line manager, Jill Claassen, colleagues and UCT libraries management for the support when I was under academic pressure towards the submission date. My sincere gratitude to UWC research office and library staff members for making this study a success.

I would also like to thank special people in my life, Lonia Marongedza Chapfika, Blessing Chapfika, Rumbidza Tembani, Rudo Nyakusendwa, Alice Chiwara Sabas, and Sharon Chirau for being there for me during the course of the study. Special thanks also go to my sister Roselyn Kunyenda for having faith in me, sisters-in-law, Tracey Nyamupfukudza Nyahodza and Netsai Mushore Nyahodza for their support. I would like to express my sincere gratitude to my mentor RuTeE for encouraging me to work hard, aunt Zvaitwa J. Chiimba and my step-mom, Loice Nyahodza for being always supportive. Lastly, a special thank you to my father, Francis P. Nyahodza and my siblings, Tonderai, Agnes, Wilson, Junior, Blantina, Julius Tich Nyahodza for being part of my journey.

Abstract

Academic libraries are challenged to meet the demands of patrons as expectations shift towards remote access to library services. In Africa, such challenges are exacerbated by the legacy of the digital divide. In this post-apartheid period South Africa has acknowledged the presence of a multifaceted digital divide, and that the inequalities established in the past have not yet been resolved. Therefore, academic libraries could be of great value in playing emancipatory roles through the provision of technologies and other resources that enable access to information by marginalised communities.

The aim of the study is to evaluate the electronic services provided by UWC academic library to Master's Students and determine if efforts made to bridge the digital divide are perceived by users as effective, through investigating use of internet-connected infrastructure, skills development programmes established to promote adequate use the e-services, and identification of challenges experienced by users as they interact with e-services. The study employed a qualitative research method, grounded in phenomenological design and supported by Critical Theory. Data was collected from two samples drawn using purposive sampling from the target population of Master's students and librarians. Data collection from students was facilitated through an online survey and six librarians were interviewed. Main themes that guided the dialogue during data collection emanated from reviewed literature. The study concludes that UWC library has emerged as a competent agent of democracy, having implemented several projects to support marginalised academic students in accessing information. The library has provided ICTs, bandwidth and skills development programmes to support students. However, the challenges encountered are diverse, and income imbalances among communities still prevail, indicating that projects and programmes established by university libraries to bridge the divide need to be ongoing and sustainable since the phenomenon cannot be exterminated.

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List of acronyms and abbreviations

ASSAf	Academy of Science of South Africa
CALICO	Cape Library Consortium
DAL	Digital Academic Literacy
ICTs	Information Communication Technologies
IFLA	International Federation of Library Associations and Institutions
IL	Information Literacy
IT	Information Technology
KC	Knowledge Commons
LIASA	Library and Information Association of South Africa
MOOC	Massive Open Online Course
NGOs	Non-Governmental Organisations
OA	Open Access
PCs	Personal Computers
QR codes	Quick Response Codes
RC	Research Commons
SANReN	South African Research Network
TENET	Tertiary Education Network
UCT	University of Cape Town
UWC	University of the Western Cape

Chapter 1: Introduction

1.1 Introduction

Academic institutions in Africa are constantly described as experiencing disparity in access to technology due to lack of infrastructure, high cost of internet bandwidth and limited computer and information literacy skills (Ngulube, 2001; Suleman 2007; Tapfumanei & Rupande, 2013), which in turn give rise to challenges in access to online information and other services provided electronically. Lack of electronic infrastructure and skills results in a wide gap in access to digital information and other electronic services. Without these tools access to knowledge is limited, resulting in the digital divide. Some associate the digital divide legacy with lack of ICT infrastructure and its related skills (Brooks, Donavan & Rumble, 2005; Tapfumanei & Rupande, 2013) and others associate the phenomenon with lack of internet connection. The digital divide is therefore not a clear single gap, but a result of a range of factors that include lower-performance computers, narrowband, internet illiteracy and lower access to subscription-based content, which prohibits the access to quality electronic research information (Brooks, Donavan & Rumble, 2005). The existence of the digital divide widely affects the provision of electronic or digital services which constitute digital scholarship.

According to Fuchs and Horak (2008: 115), the lack of economic and technological resources in Africa is an indication of the effect of many years of colonial and post-colonial exploitation. Such experiences contribute to challenges of access to information, which is the basis of economic, academic and social development (Brooks, Donavan & Rumble 2005; Donoghue, 2008). Nevertheless, information communication technologies (ICTs), internet bandwidth and relevant skills are all useful tools that promote dissemination of and access to information that depend on stable financial resources. In this instance, the provision of the ICT infrastructure and e-services can be viewed as a means to bridge the digital divide in African universities, since these facilities not only promote access to academic resources, but also to other digital services, and hence satisfy information needs of the digital age user.

Universities play critical national roles in Africa as the principal reservoir of skilled human resources, and "principal conduit for information flow and technology transfer between the industrial world and their country" (Echezona & Ugwuanyi, 2010: 1). Academic libraries therefore have the responsibility to support academic activities and research teams through information services and they lead in adopting emerging technologies (Kim and Lee, 2011: 76)

that promote various forms of digital scholarship. Pyati (2007) also described university libraries as agents of democracy in the context that library technologies play an emancipatory role in many ways. Developing technologies constantly change the way academic environments work (Andersen, 2003: 25) and transform individuals through interaction with diverse knowledge and collaborative activities in cyberspace. Electronic services allow access and sharing of information in various forms, which include text, video, visual images and audio (DiMaggio et al., 2004:36). Therefore, internet connectivity presents versatility that promotes interaction of diverse communities on virtual chat room settings or discussion forums, and the availability of such facilities provides means of connecting people of similar interest online (DiMaggio et al., 2004:36). However the usefulness of the e-services as means to bridge the digital divide is still determined by the nature of the bandwidth available for every academic institution and whether the users are skilled enough to fully utilize the available service. The more academic students are exposed to new technologies, the more their expectations and information needs change and this explains why academic libraries face demands from users to improve electronic services (e-services). Therefore, the adoption of emerging technologies is necessary to facilitate transformation through digital scholarship.

Weller (2011: 5) describes digital scholarship as a broad term which has the flexibility to accommodate new forms of practice, including being highly connected virtually, and creation and sharing of multimedia outputs with global networks of peers (2011: 5). In support of this, Andersen (2003: 5) notes that digital scholarship takes various forms including use of e-mail and listservs and other extremely complex electronic services. E-books and e-journals, social bookmarking, multimedia platforms, social networking platforms and Google alerts were also listed among digital services (Weller, 2011: 1&2). Most of the services promote knowledge creation and sharing and some facilitate virtual conferencing and seminars. All these facilities indicate the importance of electronic devices, internet bandwidth and user skills to participate in digital scholarship. With all these emerging online tools and services, the digital divide would imply a gap in participation on virtual academic and social platforms too. With lack of economic and technological resources noted in Africa some university libraries may always encounter major challenges of access to e-services, hence the existence of the digital divide.

In South Africa academic institutions have been surviving with disparities and inequities emanating from the apartheid regime, a government "system of legalized and institutionalized race discrimination and segregation in [South Africa]" (Lipton, 1986: 2).

The apartheid education system funded and equipped some institutions better than others. Therefore, in this current transformation phase universities in South Africa could each encounter unique challenges as they work towards improving gaps.

1.2 Background to this study

The University of the Western Cape (henceforth, UWC) was established in 1960 by the South African government as a university for mixed race "coloured" people only and was among the marginalised academic institutions during the apartheid era (UWC [AU], 2014). Other universities in the Western Cape are the University of Cape Town (UCT), originally for English-speaking whites, and Stellenbosch University originally for Afrikaans-speaking whites (UWC [AU], 2014). UWC's academic library was officially opened in 1989. One of the strategic goals listed on the library's website is to "provide a stable and reliable ICT infrastructure" ("UWC mission statement", 2014). From this statement, it can be presumed that the intention is to meet the shifting demands of the library patrons and the new roles of librarians in the digital age. UWC library extends its services to the UWC community, which includes students, academics and staff members, and to other South African academic communities through inter-library loans and internet sharing.

Tracing South Africa's history gives a clear picture of how harsh educational laws were imposed upon non-white[1] universities. According to Reddy (2001:140) the legacy of apartheid resulted in profound inequities and distortions of the South African Higher Education system with educational resources poorly distributed among non-white institutions. Other legislation, including the Tertiary Education Act 66 of 1988, reinforced the discriminatory regulations in the education sector, thereby establishing imbalances in infrastructure, curriculum and funding among the racially white and non-white academic institutions. UWC suffered discrimination and experienced difficulty in acquiring adequate infrastructure and educational resources during apartheid, therefore it should be among those institutions to be prioritised in this transformation phase in South Africa.

[1] Acknowledging that this term may be perceived as culturally sensitive, it is used in this document to designate apartheid-era ethnic distinctions that included "Indian", "Coloured" and "Black", in line with the literature that informed the study.

During apartheid, development of technical skills in non-white students was not a priority, whereas students enrolled were also coming from poorly resourced and managed high schools (Reddy, 2001:140). Funding was cut off from non-white universities by the government (Reddy, 2001:140), which compromised equal academic support and improvement of academic support systems like libraries. Therefore, the democratising role of libraries was not fully exercised due to political restrictions. The passing of the Bantu Education Act of 1953, also known as 'The Native Education Act', led to the emergence of a discriminatory curriculum that precluded black people from preparation for particular professional positions (Sehoole, 2005: 14). In 1958 Bantu Education became a separate department of state which had control over administration, funding and education syllabi (Sehoole, 2005). The education system and the curriculum not only deprived non-white students of courses suitable for professional skills development, but also of proper socialisation due to racial discrimination, and this resulted in the creation of wider gaps in knowledge and use of electronic devices. The situation did not improve until 1990.

The stipulations of apartheid legislation and differences in curriculum could help to explain why the former 'white' universities are still leading in research productivity and infrastructure. The curriculum for non-white students did not prepare them for critical thinking, and research was produced by white students (Sehoole, 2005: 33), yet every academic institution needs to develop research capacity. UWC has, however, emerged as a competent university in the post-apartheid period and, like any other university, its students engage in research and start publishing at Master's level.

ICTs have created opportunities for libraries to transform and for previously disadvantaged libraries to recover some lost ground through virtual services. ICTs have transformed libraries to facilitate virtual services that promote knowledge creation and sharing, although developing nations are still digitally marginalised with inadequate internet bandwidth and limited advanced technologies (Echezona & Ugwuanyi, 2010).

Transformation takes a long time and literature indicates that in this post-apartheid period South Africa is still poverty-stricken with high crime rates, biased income distribution, and social and ethnic inequality (Fuchs & Horak, 2008: 115). UWC may still attract students from disadvantaged and low-income communities because of its accommodative nature in the past. It also attracts international undergraduate and postgraduate students of mixed backgrounds.

South Africa has acknowledged the presence of the digital divide in the country due to the lack of ICTs, skills and inadequate bandwidth (Donoghue, 2008; Naidoo, 2012), and the position of some universities may therefore still be vulnerable. This study evaluates the e-services offered to Master's students by UWC academic library to explore users' experiences and perceptions of the digital divide.

1.3 Research Problem

South Africa has acknowledged the nationwide presence of a multifaceted digital divide in universities and in urban and rural schools. As indicated earlier, the country is being affected by the lack of ICTs, internet bandwidth and adequate skills (Donoghue, 2008; Naidoo, 2012). According to Norris (2001), a secondary digital divide arises from inequalities among the population within one nation, and this intensifies the divides among any existing social classes. In South Africa all facets of the digital divide can be traced back to the apartheid regime, which was characterised by social and democratic injustice. Norris (2001) views the internet as a social or political construction and political institutions have been relatively conservative toward the use of the internet since it could be used for civic participation, mobilisation, and deliberative democracy. The historic experience of non-white universities in South Africa that operated with limited educational resources and controlled access to information confirms technical resources (including the internet) as social or political constructions of regime.

Another by-product of the digital divide is the negative impact it has on education efforts (Brooks, Donavan & Rumble, 2013: 271). Lack of ICT resources affect research productivity since it limits access to quality scholarly content and virtual collaborative research activities. Suleman (2007: 3) confirms the challenge of bandwidth affordability in Africa and clarifies that, "in those parts where there is Internet access, the resources, such as bandwidth, are severely limited or extremely expensive". Scarce resources like internet bandwidth could still be a challenge among the previously disadvantaged universities and communities of South Africa.

The post-apartheid government of South Africa was obliged to instigate equal distribution of academic resources, thereby reversing the past experiences of the marginalised. The priority was to implement a binding policy that would address the inequities in academic infrastructure and resources in universities. Sayed and Jansen (2001: 6) argue that the educational policy "reflects the mismatch between policy intentions, policy practice and policy effects", which

implies that the policy exists, but that it has not yet tangibly forged a system that sets conditions for institutional change. UWC, the research site of the study, was subjected to some level of marginalisation during apartheid and was deprived of educational resources. If new transformation policies have not been effectively implemented the formerly disadvantaged could be experiencing various facets of the digital divide.

Information service providers constantly evaluate the dynamics of the information world in order to improve and provide relevant electronic services to users. As users adopt trends in remote access and information sharing, academic libraries have to prioritise the provision of ITC infrastructure, internet bandwidth and transfer of skills to promote adequate use of resources. The study engages UWC academic library users at Master's level to share experiences and perceptions on ICT infrastructure, skills and the challenges encountered. Master's level is the initial stage of a research journey that demands the use of critical online tools.

1.4 Objectives of study

The aim of the study is to evaluate, from the user perspective, if the electronic services provided by UWC academic library to Master's Students to bridge the digital divide are perceived as effective, through investigating availability and use of internet-connected infrastructure, adequate skills to use the services, and identification of any related challenges experienced.

1.4.1 Sub-objective of the study

The main objective of the study is unpacked into sub-objectives to further clarify what the study intended to achieve. The sub-objectives of the study are:

a. To determine the extent of and reasons for use of networked infrastructure by UWC Master's students in the library or on campus;

b. To determine if UWC Master's students perceive the UWC library's e-services as meeting their needs;

c. To investigate programmes established by UWC library to promote the use of e-services by postgraduate students; and

d. To identify challenges associated with e-services available at UWC.

1.5 Research questions

The study was guided by the major research question below:

How have the electronic services offered by the University of the Western Cape academic library been useful in bridging the digital divide?

1.5.1 Specific research questions

1. How often do Master's students at UWC make use of the electronic infrastructure in the library or on campus and why?

2. Do the library services at UWC meet the information needs of the Master's students?

3. Has UWC library established and incorporated skills programmes that improve the use of e-services by Master's students?

4. What challenges are encountered by Master's students when interacting with the e-services offered by UWC library?

1.6 Significance of the study

During professional experiential learning at UWC in June 2012, the researcher observed that the library had moments of struggle with internet access. A few days spent at UWC revealed that the internet was sometimes down. Those few occasions disrupted the duties of librarians and perhaps had an impact on the students' interaction with e-services. Librarians at UWC confirmed that the internet was sometimes extremely slow and would affect the working routine of e-services. Such an experience at a historically disadvantaged university, which is likely to accommodate primarily students from low income communities, has some social and political implications. This motivates the further exploration of experiences and perceptions of the UWC community to determine what has been done to bridge the gaps created in the past

The availability of ICT infrastructure, sustainable bandwidth and adequate skills promote the effective use of e-services, thus bridging various information gaps. This could be supplemented by education: restructuring the system and improving the curriculum to equip university graduates for lifelong learning. This study explores the availability and use of internet connected infrastructure by a selected group of postgraduate users to determine experiences and perceptions of users about the services being offered. The findings of this study could

contribute to existing knowledge by investigating the experiences of communities in the previously disadvantaged universities, thus reflecting institutional progress during this transformation period. This study values the perceptions and experiences of users, since they are directly affected by any changes.

1.7 Definitions of useful terms

Various terms useful to understanding some aspects in the study are described below:

1.7.1 Digital divide

For the purpose of this study the digital divide refers to gaps that exist due to the lack of access to information infrastructure and skills, that compromise socio-economic and socio-political equality.

1.7.2 Effectiveness

Roysri (2011: 70) defines e*ffectiveness* as "the ability to accomplish a purpose of organization" or getting intended the results from an action or organisation. Onuoha et al. (2013) associate service effectiveness with judgment by direct users on how well a service is performing and this relates to whether a service is perceived to meet specific user needs or not. Onuoha et al. (2013: 85) further identified from various studies the necessary issues to note when dealing with library service effectiveness and these include "accuracy and reliability; speed and currency of the services: accessibility; competence and helpfulness of staff and effectiveness and efficiency of that service".

1.7.3 Electronic library

Terms *electronic library*, *digital library* and *library without walls* are used to refer to a virtual library, which is described as an environment that "permits e-learners to access library and networked resources and services anytime and anywhere that an Internet connection and computing equipment are available" (Johnson et al., 2004).

1.7.4 Electronic services

Digital, virtual or electronic services are used interchangeably to mean services that are accessed online through the use of the internet. The services are provided as a result of internet-connected electronic devices, networked 'work stations' or computers, entailing the need for the availability of speedy internet access and relevant skills to use the tools. DiMaggio et al. (2004: 3) describe the *internet* as an "electronic network of networks" that links people from home and work places enabling email exchange, participation in interactive spaces of various kinds, and visiting of sites on the World Wide Web. The description is therefore inclusive of various electronic means of communication and information-sharing platforms which are commonly known as social networking platforms.

1.8 Research Methodology

The study employed a qualitative research method, which promotes discovery and exploration of issues and regards the researcher as the primary instrument of data collection and qualitative analysis (Johnson & Onwuegbuzie, 2004: 18). Phenomenological qualitative research design and Critical Theory were selected to inform the study. They both emphasise the use of dialogue to explore patterns of experience and encourage the collection of data from participants experiencing the phenomenon under study. The digital divide as a phenomenon is a common experience among a group of people, and phenomenological research design explores a phenomenon or experience with individuals who have all been experiencing the same phenomenon (Creswell, 2013: 78).

Purposive sampling, also commonly known as judgemental sampling (Kumar, 2011: 207), was used to identify two samples that were used as units of data collection. With purposive sampling, individuals could be selected as data collection participants because they "can inform an understanding of the research problem under and central phenomenon in the study" (Creswell, 2013: 156) or they provide information that can best inform the researcher on the issues under study (Kumar, 2011: 207). Master's students from the Faculty of Arts were selected to respond to an online survey; UWC librarians were selected for interviews since they are experts in information services and also use the services under study. The questions for the survey and the interview used similar themes to provide points of data convergence for enriched analysis. Questions were derived from the objectives of the study for validity

purposes. The instruments were pre-tested to check for clarity issues and avoid ambiguities. The research proposal and instruments were scrutinised by an ethics committee to ensure that the planned research activities may not harm participants in any way. Data collected was analysed using NVivo and SurveyMonkey software and findings were presented in various themes using text, figures and tables. Conclusions were drawn based on the discussion of findings and recommendations were made.

1.9 Limitations and delimitations of the study

According to Kumar (2011: 237), "limitations designate the structural problems relating to methodological aspects of the study", which are beyond the researcher's control. A limitation for this study was the provision of an unrevised list supplied from the Faculty of Arts. The researcher requested a sample of Master's students, but the list provided was not accurate since it included other levels of postgraduate students as well. However, the researcher decided to use data collected from all postgraduate students since it would still be useful in exploring the phenomenon under study.

Simon (2011: 2) describes delimitations as "characteristics that limit the scope and define the boundaries of your study". The study focuses on the experiences and perceptions of the Master's students from the Faculty of Arts at UWC on the e-services offered by the library. The site was selected on the basis of its history of accommodating students of mixed backgrounds, thereby arguably presenting a representative case of the digital divide in a higher education context. A sample was drawn as a time- and cost-effective measure to work with a manageable sample size.

1.10 The report structure

The research report is divided into five chapters including:

The current chapter, which provides the introduction and background to the study, and which covers various aspects like the research problem, research objectives, research question, and significance of the study.

Chapter Two, the literature review, discusses issues relevant to the study, as presented by other researchers in the same field. A literature review widens the researcher's understanding of the complexities of the core issues of the subject, which will form the basis of new arguments

through summarising and integrating what is known in the field. This chapter also includes the theory that informs the study.

Chapter Three presents the research design and methodology, discussing the overall design of the study, and methods and instruments used for data collection and analysis.

Presentation of findings is covered in the fourth chapter, where data collected is summarised in figures, tables and text to aid in the understanding of data.

The fifth chapter discusses the main findings in the context of the literature reviewed, research objectives and the theory that informed the study. The researcher suggests how the new knowledge adds value to existing body of knowledge and summarises the dissertation.

1.11 Summary

This chapter introduced the context of the study. Objectives of the study and research questions that guided the study were also discussed. A brief description of the research methodology and definitions relevant to the study were presented. Limitations and delimits were also indicated. The following chapter reviews literature and discusses in detail the theory that informed the study.

Chapter 2: Literature Review

2.1 Introduction

Reviewing of literature is a process of familiarising the researcher with the existing body of knowledge relevant to a topic, yielding both "conceptual and methodological resources" that equip the researcher with useful theoretical positions, research methods and techniques in the selected field of study (Mouton, 1996: 120). This also creates an opportunity for the researcher to become familiar with current issues, ideas and terms or concepts that surround the topic (Neuman, 2012: 73) and what other researchers have discovered, thus making way for comparison of the new findings with existing knowledge. This chapter discusses the theory that informed the study and themes emerging from literature. To set some context of South Africa's experiences of the phenomenon in discussion, the history of the education policy of South African and its contribution to some divides in the higher education system is also discussed.

2.2 Theoretical Framework

This study was informed by Critical Social Theory developed by the Frankfurt Institute social research scholars Horkheimer, Marcuse and Odorno, who aimed to reconstruct logical ideas that suitably responded to the emerging Twentieth Century capitalism (Agger, 1991; Comstock, 1974) which only benefitted the minority elite communities. According to Budd (2008: 175), research drawing from critical theory has central critique elements that include historical examination as a central element in analysing current social realities, use of communication and language as analytical and normative bases for inquiring into "social action" and "the force of ideology and its influence on social action". History and language are essential elements in understanding people's current social experiences and critical theorists value the aspect of engaging subjects in a dialogue that positions participants as sources of social reality (Cohen & Crabtree 2006). At the centre of critical theory also lies the aspect of democracy (Cohen & Crabtree 2006) and potentials of emancipation (Budd, 2008: 176). The digital divide impedes access to digital information, a valuable social, economic and academic tool for building an information and knowledge based economy, thereby affecting the potential of information service providers to play an emancipatory role in marginalised societies. Restriction to information access has been also used as a political tool to benefit the dominating minority communities, thus perpetuating socio-economic imbalances.

South Africa is among many African countries that previously operated under colonial rule, and had its native people excluded from various socio-economic sectors and from participating in policymaking (Sehoole, 2005: 25). In South Africa policies used education as a tool to exclude the non-white communities from full social and political participation. After the attainment of universal emancipation in South Africa, libraries in historically disadvantaged institutions had to resume their emancipatory roles by aligning their goals with the transformation mission of parent institutions to clear the mess of exclusion and monopoly created during apartheid, particularly in respect of restricted access to information. User demands faced by information service providers include closing gaps created in the past by promoting electronic services that do not confine users to the physical library space.

As defined earlier, the digital divide means a lack of technological infrastructure, internet and inadequate skills to access information, and according to Pyati (2007) the commercialisation of the internet and information attest to the socio-political problems of the modern society. Although colonialism is long gone, the capitalist element is still expressed in political control by the elite who dictate the economic structure of the world. The global decisions that economic powers make contribute to the socioeconomic challenges of the greater population of the poor. This is clearly visible in the gaps in affordability of resources by some countries and struggles to have minimum access to resources by others. The majority of communities in Africa are still living in poverty with low incomes, struggling to afford the proper infrastructure to access information. South Africa's National Development Plan drafted in 2012 acknowledges the existence of poverty and income inequalities among local communities, and the government proposed to eliminate these by 2030 (Manuel et al., 2012: 24). The historical effects of apartheid are still weighing on the achievement of democracy.

Pyati (2007) adopted Critical Theory in Information Science to analyse the democratic roles of library technologies. Academic libraries currently prioritise meeting user needs through the provision of emerging technological infrastructure and media, and skills training to promote dissemination of and remote access to information to support activities planned for academic and social communities. In so doing, libraries participate in transformation and also play a democratic role towards building an information society, which can only be achieved by freedom of access to information, including global scientific knowledge.

With the availability of networked infrastructure and adequate skills, together with the arrival of the Open Access movement to open up scholarship (Mutula, 2009) to previously

marginalised stakeholders, libraries may be successful in supporting access to a broader body of scientific knowledge. This minimises expenditure on database subscriptions, although academic libraries in Africa might still encounter challenges due to the decline of state funding (Mutula, 2009: 1) in upgrading their infrastructure. Nevertheless, libraries continue to prioritise the upgrading of infrastructure and channel efforts towards open access publishing to improve access to information and support the creation of scientific knowledge.

Budd (2008: 176) identified some methodological aspects of critical theory that are useful in qualitative enquiry. These allow a researcher to engage with the unit of analysis through dialogue and disclose "restricting factors and potentialities for emancipation". Critical theory suggests dialectical methods of gathering data by engaging the participants as subjects rather than objects. The theory selected is also used in the discussion as a tool to analyse various factors that influence the experience of the digital divide in developing countries. The relationship between the actions of former political systems in South Africa and the current experiences of the digital divide are outlined in this chapter.

2.3. Education policy in South Africa and the digital divide

This section discusses the history of education policy and experiences of academic institutions in South Africa, to establish the role played by apartheid in the current experiences of the digital divide. Education policy in South Africa has experienced a significant transformation as the nation adjusted from apartheid, a period characterised by white domination and discrimination against native people. As noted earlier, both Brumfield (2010) and Pyati (2007) agree that an academic library (through its collection and ICTs) acts as an agent for democracy, but the role of libraries is facilitated and well developed if existing policies support the independent development of library collections.

Literature on the history of South Africa's educational policy reveals severe restriction of access to various education materials and resources and the control of non-white academic institutions (Mabokela & King, 2001; Sehoole, 2005). The social and democratic roles of some libraries were suppressed and they could not exercise independent choices in collection development, neither were they sufficiently funded (Mabokela & King, 2001: xiii) to upgrade infrastructure for improved information services. Policies are instruments that stipulate and control what organisations or stakeholders can do. Academic institutions are established to

develop communities, but apartheid policies and laws only supported the enhancement of white supremacy at the expense of black universities.

2.3.1 Legislation in the education sector

Literature shows that during apartheid, legislation and policies were developed with the intention of oppressing non-white South Africans. With the understanding that education has the potential to enhance human development and prepare citizens to participate freely in various sectors, apartheid government planned to use education as a tool to oppress non-whites (Mabokela & King, 2001: xx). The government exercised censorship and propaganda, "banning selected literature" (Sehoole, 2005: 34), and sought means to perpetuate white supremacist ideologies. According to Jowett and O'Donnell (2012: 2) propaganda is "the deliberate, systematic attempt to shape perceptions, manipulate cognitions, and direct behavior to achieve a response that furthers the desired intent of the propagandist" who is the communicator of the message. For Jowett and O'Donnell a message is identified as propaganda if it suggests something negative or dishonest (2012: 2). In this view propaganda could be used as administrative techniques that are used to strengthen governmental powers and maintain a successful control of communities at the expense of other citizens. The legislation and education system were designed as tools to institutionalise racial oppression through hierarchy of social, economic and political opportunities (Mabokela & King, 2001: xiii).

The apartheid government of South Africa tasked the Eiselen Commission to engage in research on how to develop apartheid. This led to the establishment of the separate development project of Afrikaner nationalism (Reddy, 2004: 12). The passing of the Bantu Education Act of 1953 and the Extension of University Education Act of 1959 (Mabokela & King, 2001) followed, with the intention of restricting the socioeconomic activities of non-white communities. Divisions were created between South African communities and these are still reflected among South African communities and academic institutions.

The Extension of University Education Act and the Separate Development Act, both passed in 1959, were directed towards separating the South African youth at the higher level of education on the basis of race (Sehoole 2005: 15). According to Sehoole (2005: 15) the laws instituted the Bantustans or homeland policy, which grouped black South Africans into self-governing ethnic groups, created universities according to ethnic and racial groups, and created separate governments for the Indian and so-called coloured races, respectively. A new admissions

policy was also established to maintain the homeland university education system and restrict enrolment of non-white students in white universities (Mabokela & King, 2001). The racial separation of communities in universities also meant differences in the curriculum, educational resources and infrastructure. The institution's racial population would then determine the nature of curriculum, the quality of resources and the infrastructure to be supplied.

2.3.2 Curriculum development during apartheid

Apartheid legislation and policies in South Africa compromised the quality of education in non-white schools and universities by giving limited funding, inadequate educational infrastructure and inferior curricula (Maboleka & King 2001; Reddy, 2004; Sehoole, 2005). White students were exposed to a well-designed curriculum which equipped them for all high-level jobs in science and technology with no competition from non-white races (Sehoole, 2005: 22), whereas non-white universities exposed students to a curriculum unsuitable for the development of advanced technical or critical skills, to avoid empowering youths for the creation of revolutionary groups that could mobilise other black communities to fight and advocate for decolonisation (Reddy, 2004: 10). In addition, restricted access to information also made it challenging for non-whites to compete in the business sector.

The curriculum for non-whites was intended to produce civil servants and secondary teachers, whereas the curriculum for their counterparts was intended to develop scientists (Sehoole, 2005: 22). White institutions offered all medical and science courses including technology, and the curriculum emphasised critique, analysis (Sehoole, 2005) and application of concepts while engaging in scientific research, a learning element missing in the non-white institutions. As a result, white graduates acquired an economic status with stable income while non-white communities occupied low-income positions. Efforts made to improve non-white education by other stakeholders through creation of relevant texts, syllabi and supply of various informative materials - especially political resources - were banned and individuals found in possession of any banned content would be arrested (Sehoole, 2005). The economic gaps and social classes created in the past still persist in this post-apartheid era. In this transformation phase, it has been noted that "post-apartheid has brought formal equality, but social and ethnically biased inequality continues to exist" (Fuchs & Horak, 2008: 115). This demonstrates the impact apartheid legislation and policies had on the nation's socio-economic structures.

2.3.3 Language policy

Language became a contentious issue in developing the education policy in apartheid history. The home language policy introduced exacerbated the poor quality of education and the chances for non-whites to compete at university level. Twenty-two South African universities were established during apartheid, including those established within independent homelands, thus separating universities along racial boundaries, having culture and language clarifying the demarcations (Mabokela & King, 2001: xiii). The language policy mandated the use of mother language in the first eight years of school (Mabokela, 2001: 62), whereas educational resources were not translated into local languages. Non-whites in South Africa were made to believe that the government was doing them a favour by assigning teachers to use vernacular language whereas this was actually a means of excluding them at higher education levels (Sehoole, 2005). Non-whites were at a disadvantage in positioning themselves globally, since they were not equipped to use English competently, and currently the language is critical both in the exhaustive use of emerging technologies and engaging in international business.

2.3.4 Infrastructure and resources

Historically non-white universities experienced lack of funding and inadequate infrastructure, while their white counterparts had advanced equipment and improved library facilities (Sehoole, 2005: 22). White students produced the majority of research in South Africa thanks to adequate training on the production of scientific knowledge and adequate facilities (Sehoole, 2005). In non-white universities, apartheid severely limited libraries' roles as democratic agents by controlling facilities, courses and literature. This was a violation of people's democratic right to access information. When apartheid ended, academic libraries were under pressure to transform their space, infrastructure and collections to prepare an atmosphere conducive for research support and meet the demands of the digital age user. Historically disadvantaged universities could encounter more challenges than former white universities since resources were previously and are still unequally distributed. Most non-white parents, unlike their white counterparts, were both academically and economically disadvantaged during apartheid (and continue to be disadvantaged). Therefore, acquiring of ICTs for their family members might not be a priority. However, most students in universities possess smartphones and, these could be used for academic purposes. According to Brown and Czerniewicz (2010: 366) searching the internet via cell phone has become a regular activity in

South African universities, therefore possession of cell phones could improve the infrastructure gaps of the past.

2.4 Factors influencing the digital divide

The digital divide is a phenomenon linked to 'unequal patterns of internet access, material access to, usage capabilities of and benefits from computer based-information and communication technologies' (Fuchs & Horak, 2008). Material access, as further described by Fuchs and Horak (2008: 100), is the availability of hardware, software and applications, and also covers the usability of the available ICT devices and applications. Computers, internet bandwidth and skills are all critical tools for bridging the digital divide, therefore the phenomenon can be divided into "technology divide, bandwidth divide and skills divide" depending on the challenges being posed to individual communities. However these various facets of the digital divide could also be result of various socio-economic factors.

2.4.1 Information and communication technology (ICT) infrastructure

Information and Communication Technologies (ICTs) have brought to various communities interconnectivity and an accelerated flow of information, thereby decreasing time and international boundaries (Herselman & Britton, 2002: 270) for the information user, thus dealing with the social aspects of the digital divide. ICTs function with software, hardware and internet connectivity. There are challenges of ICTs, internet connectivity and skills in African academic institutions due to declining funding (Chiware, 2007; Mutula, 2009). According to Jensen (2006: 1) bandwidth is scarce and a limited number of schools, academic libraries and research centres in Africa are connected to the internet. The majority of non-white South Africans, particularly black and female individuals, are still excluded from the use of internet (Fuchs & Horak, 2008: 110) because of the nature of the socio-economic classes established during apartheid.

Research conducted at the University of Cape Town in South Africa in 2010 on the use of Research Commons (RC), a library facility that provides working space for research students, indicates that some graduate students depended on electronic devices loaned and used within this designated space since they come from less privileged environments where computer workstations and internet resources are rare, and cannot afford to purchase personal laptops (Daniels, Darch & de Jager, 2010: 128). The researcher's experience during field work at UWC

in June 2012 acknowledges occasional challenges of slow internet speed encountered by UWC library and this motivated further exploration of current experiences of the users in this institution. Organisations make efforts to improve their situations but the socio-economic challenges of South Africa may hinder new developments in universities.

With the majority of South African communities living in poverty (Manuel et al.; 2012: Fuchs & Horak, 2008: 115), the government may focus more on other pressing social issues to supply poverty-stricken citizens with basic needs including food, shelter and primary health care. In this case prioritising ICTs and internet connectivity would be viewed as a luxurious gesture. As agents of democracy, academic libraries would therefore be expected to fulfil emancipatory roles through the provision of ICTs and e-services, especially for the marginalised low income communities who cannot afford personal computers.

2.4.2 Language implications on the digital divide

The use of emerging technologies, particularly to access information from vendor databases at higher education level, requires a good command of English which may be a challenge for various non-white communities who had not had good exposure to the language previously. Currently many schools might have adopted English as a medium of instruction, but the use of English remains a challenge since it is not the first language for the larger population of South Africa. On the other hand, the apartheid language policy deprived non-white students at primary schools of the opportunity to develop a good command of English that could help them to exhaustively use e-services. Black parents would also struggle to support their children because they had had limited exposure to the language during apartheid.

2.4.3 Curriculum implications for the digital divide

The inferior curriculum designed for non-white universities during apartheid exacerbated the lack of skills experienced by some individuals in South Africa, and hence the historic and persistent digital divide. Schools may have redesigned the curriculum, but, as highlighted by Fuchs and Horak (2008), the past inequalities have not yet been resolved and some individuals still have no access to facilities that enable the skills development process. However, academic institutions with the support of libraries have an obligation to develop citizens by creating a curriculum, providing networked infrastructure and services that enhance human development through information access.

2.4.4 Economic challenges and the digital divide

It is evident that the digital divide further disadvantages marginalised low-income communities since these will have little or no access to computer networked stations and sustainable bandwidth. Fuchs and Horak (2008: 102) attribute the causes of the digital divide phenomenon to the "multidimensional class structure of modern society that creates structural inequalities". There are highly pronounced social classes among South African communities, which can be traced back to the period of colonialism and apartheid and income distribution is highly imbalanced. In 2008 in South Africa, the presence of the digital divide was acknowledged and compared to the discriminatory nature of apartheid (Donoghue, 2008). The comparison between these phenomena is a metaphorical expression that demonstrates the depth of the impact of both apartheid and the digital divide on the human race. The argument implies that the social and economic inequalities that existed during apartheid are being perpetuated by a lack of Information Technology (IT) equipment, bandwidth and skills (Donoghue, 2008). This view was shared to enlighten people about what is transpiring in South African schools and universities in the supposed transformation phase. Most rural and other urban schools in South Africa are still under-equipped with limited or no ICT infrastructure (Naidoo, 2012) including broadband, though a great improvement has been noted in tertiary institutions.

Fuchs and Horak (2008: 115) argue that the lack of economic and technological resources in Africa is not a result of corrupt African governments, bad governance, market protectionism and other aspects raised by various global economists, but rather an indication of the "effect of hundreds of years of colonial and post-colonial exploitation, exclusion, and dependency of the Third World". In this post-apartheid period South Africa is still experiencing unequal distribution of income, educational resources and high crime rates (Sehoole, 2005; Fuchs & Horak, 2008: 115). This supports the Marxian approach that concludes that historical analysis is not just explanation of events but also indicative of current states, pointing at societal action and how large-scale policies impact on experiences of individuals in society (Budd, 2008: 176).

2.4.5 Internet connectivity

Internet connectivity brings the comfort of accessing information regardless of geographical boundaries. Literature shows how information service providers value networked computer work stations and many efforts made by libraries to provide internet access. However,

Echezona and Ugwuanyi (2010) note the challenges of low speed internet infrastructures in African universities, which are operating at bandwidth capacity in kilobits per second, whereas those in developed world are in megabits and gigabits per second.

Brumfield (2010) points at critical theory as a lens to analyse libraries' power dynamics to participate in the information society. Low internet speed affects the flow of academic activities and the effect could be felt more in universities that attract students from low-income communities since these could be the only gateways to networked computer stations. Evidence found in 2008 indicates that most countries in North Africa were leading in internet penetration compared to their African counterparts, and in Southern Africa, South Africa had the highest internet penetration of 7,4 %. It was emphasised that the digital divide was pressing in Africa, and in South Africa blacks and female white individuals are excluded from the information society (Fuchs & Horak, 2008: 103).

2.4.6 Skills

While infrastructure and bandwidth are relevant to issues of information access, these tools may be of little use if the users lack skills to utilise them. Block (2010) cited various sources to describe the impact of the skills-related divide which ranges from the inability to "use a mouse and typing, using word processing and spreadsheet programs, using e-mail, and locating information on the World Wide Web". According to Mossberger, Tolbert and Stansbury (2003: 38) internet and ICTs are insufficient without skills to use the technology and find information, therefore a user requires both technical and information literacy skills "to fully exploit the potentials of information technology". They define information literacy as the ability to recognise an information gap and successfully employ information sources to find the information required to satisfy the need (2003: 38). The lack of skills to find information online has been noted among academic students in Africa (Mutula, 2009). Research conducted to assess information technology (IT) skills of Health Sciences students at the University of Cape Town indicates that IT skills of students at South African universities range "from a high degree of proficiency to complete novices" (Oberprieler, Masters & Gibbs, 2005). Such challenges inhibit users from satisfying their information needs and only those with exposure to ICT infrastructure can develop the relevant skills to effectively use the available technology. Nevertheless, it has been acknowledged that South Africa universities are

implementing information literacy programmes but these have not yet been embedded in teaching and learning for more effective results (Mnkeni-Saurombe, 2015).

2.5 Efforts to deal with the digital divide

Research has recorded many initiatives towards bridging the digital divide by foreign agencies, government departments, and private and public sectors. Czerniewicz (2004:147) attests that, "the South African government holds strong views, evident in a range of policies and initiatives, about the need to overcome the digital divide and for all sectors of society to participate in the new informational economy". In South Africa academic institutions are taking initiatives to identify the various facets of the digital divide being experienced by their students in order to alleviate the existing gaps. There is a connection between the digital divide, education and income inequalities, and this contributes to the development of social classes. After apartheid, the government of South Africa had to reverse social structures established during apartheid. Education was identified as a major social institution used to control and reproduce social economic inequalities (Assié-Lumumba, 2006: 39), similarly this social institution was regarded a useful agent to redistribute the economy and reverse the social identities created in the past, and a lot has been done to strike a balance between the historically white and non-white universities.

2.5.1 Efforts by schools and universities

It has been noted that in Africa, the number of schools and academic institutions acquiring and upgrading computer networked stations has significantly increased, although there are still individual challenges to access broadband and advanced infrastructure to improve computer-user ratios. South African academic institutions have successfully improved and incorporated ICT infrastructure in order to enhance the quality of education and knowledge creation through convenient access to information and e-services.

South Africa is also making efforts to identify the root factors contributing to the current experiences of the digital divide, and is working on measures to bridge the gaps. Daniels, Darch and de Jager (2010: 116) noted the establishment of an access-controlled Research Commons in the library by the University of Cape Town (UCT), in which hardware and software (internet connected computers and multi-purpose printing machines), as sophisticated and up-to-date as possible, were provided following a survey that indicated what users expected in a research

support environment. A Research Commons is described as physical space with various digital services to support research (Daniels, Darch & de Jager, 2010). The space benefits both postgraduate students and academics. The RC facility at UCT, for example, takes into consideration the less privileged postgraduate students as it loans notebooks to those without personal laptops (Daniels, Darch & de Jager, 2010: 128). This is an additional facility in the library, but there are other wider spaces with networked infrastructure for other users groups.

The Ministry of Education introduced programmes that provide technical computer and skills at primary and high school levels. However, schools have not equally benefitted from the implemented projects. Naidoo (2012) notes that "while a number of schools in urban South Africa have incorporated the latest technology in the classroom, for schools in rural areas being part of the digital generation is marred with challenges". Rural learners are still left behind and are likely to enrol at university with little or no exposure to the internet, making it difficult for higher education institutions to be complacent in bridging the gaps.

2.5.2 Efforts by other stakeholders

The South African Research Network (SANReN) and the Tertiary Education Network (TENET) were established to rectify bandwidth-related challenges in South Africa. (MacGregor, 2008). The University of Witwatersrand and the University of Johannesburg, were the first pilots for the SANReN projects (MacGregor, 2008). Such an initiative acknowledges the presence of the secondary digital divide of limited bandwidth in South Africa. However, prioritising these historically "white" universities as pilots could deepen the inequities created during apartheid, especially if funds run out before the project spreads to previously disadvantaged universities. Various consortia have been also established to enable academic institutions to work collaboratively to cover internet connection costs with help from NGOs and some telecommunications companies. According to Echezona and Ugwuanyi (2010: 2), "the partnership for Higher Education in Africa (including the Ford, Macarthur, and Rockefeller foundations) has helped a consortium of 13 African universities to cover connecting cost". Such collaborative efforts could assist in providing sustainable internet access in higher education institutions, thus improving information flow and other e-services.

The Department of Higher Education and Training recently tasked the Academy of Science of South Africa (henceforth, ASSAf) to ensure that researchers have increased access to quality scholarly content published in highly accredited journals (Keating, 2014). The major concern

is to provide equal access to quality research for South African academics by creating a national site for vendor databases with licenses fully paid for. ASSAf has formed an Academy Advisory Committee that will work on the implementation of a national site that will allow local researchers access to high-cost, commercial electronic full-text scientific research and other useful databases (Keating, 2014). According to Keating (2014), this project will benefit the less-funded universities with severely limited access to journals and other academic resources.

2.6 The value of e-services in academic institutions

The digital era integrates digital or electronic services through a networked environment that permits the use of electronic devices like desktops, notebooks, tablets and smartphones to access information. When librarians make use of the networked information and communication technologies to "develop, manage and deliver resources and other services" (Johnson, Trabelsi & Tin, 2004), this work is also classified under electronic, digital or virtual services. According to Pritchard (2008: 220), "digital infrastructure can be defined conceptually to include the spectrum created by interlinked digital content, digitally based business operations, digital communication and dissemination, digital research tools for analysing and visualizing information, and digitally created surrogate worlds". Therefore, internet access promotes a wide range of virtual services.

2.6.1 Information sharing and collaboration

E-services introduced a new trend of networking for the purposes of sharing scholarly content among peers. They also promote the provision of information in multiple formats, which makes it manageable for users and librarians to save, export or email portable information files. The electronic environment has also promoted the extension of library resources and services beyond the physical library building, thereby providing information materials at the patron's personal virtual space. Patrons can access journals and books from various databases, and Open Access (OA) has made the access to other online materials like reports, conferences and workshop presentations, talks, lecture presentations and other teaching materials possible through various platforms including library websites, repositories and social media. The information can easily be saved for later use or shared among peers.

According to Mutula (2009: 7) internet-based services have enabled the integration of various e-services into single point for ease access. Additionally, the services promote digitisation of

scholarly content for OA and the development of e-research portals and sharing of research data (Mutula, 2009: 7). According to O'Brien (2005: 66) "e-research is a broader term that includes non-scientific research but that also refers to large-scale, distributed, national, or global collaboration in research". Digital services promote open scholarship and the sharing of open access scholarly content both for academic and social development, and bring researchers from various geographical locations to collaborate in knowledge creation through electronic means. Open Scholarship has enabled dissemination of scholarly content created by university researchers (Mutula 2009: 8) and allows visibility of their research output. University libraries and users benefit from open access scholarly content since access is free, thus reducing the challenge of access to information caused by the high journal subscriptions. All these services are at the disposal of the local users since university archives share scholarly content and make users aware of the services available.

O'Brien (2005: 66) noted the PARADISEC, a collaborative digital research resource established by three universities in which material that was at risk of being lost was preserved in various formats, including sound recordings in 259 languages, and has been made publicly available to the global community for teaching and learning. Research students could engage in such research collaborations and share the results of the products with the global research community.

2.6.2 Virtual learning

Mu, Dimitroff, and Burclaff (2011: 120) note that the use of "virtual reference services", which are part of e-services, have made library services convenient to library users of the digital age since these permit online consultation and academic support, with the additional advantages of chat forums, instant messaging and virtual environments used to answer reference questions, and promoting the use of MOOCs. However, most of these services require broad bandwidth to be effective.

Vardi (2012: 5) defines a MOOC as a "massive open online course; a tuition-free course taught over the Web to reach a larger number of students. In order to allow large-scale participation the course is facilitated as Open Access having its content accessible via the Web" (De Waard et al, 2011). The concept of MOOCs led to the development of a new system, the MobiMOOC which links three innovations – mobile technology, social media and the MOOC – to work collectively as its format for learning and teaching (de Waard et al, 2011: 96). Both the MOOC

and the MobiMOOC promote education through virtual or electronic learning ("e-learning"), which has been adopted as a powerful educational tool by various institutions and sectors to empower communities regardless of their geographical locations.

2.7 Summary

Research has revealed the digital divide to be one of Africa's major challenges. Evidence indicates that historical factors still influence the persistence of the digital divide in Africa. This chapter discussed factors that influence the digital divide of some less privileged communities. Historical factors that influenced academic institutions' experiences of the digital divide in South Africa were explored. This chapter also discussed the value of e-services in bridging the digital divide and exposing communities to virtual learning that promotes education and development. Initiatives made by various communities to bridge the digital divide have also been identified. However, assessments and evaluations need to be made consistently in order to ensure that technological infrastructure, bandwidth and skills are available since these promote effective use of e-services. The bridging of the digital divide becomes a success when measures are taken to ensure that no members of the community are excluded in accessing ICTs, bandwidth and skills.

Chapter 3: Methodology

3.1 Introduction

An approach to systematic enquiry stipulates the process and procedures to be conducted by the enquirer, and the process is informed by both the philosophical and theoretical assumptions that the researcher brings to the field (Chilisa & Kwaluchi, 2012: 51). In support of this, Mouton (1996: 37) states that methodological paradigms are not just collections of methods and techniques for research, but also assumptions and values that pertain in the choice of certain tools in specific circumstances. Research as a process of finding answers and creating knowledge requires an early identification of a relevant approach, strategy or methodological paradigm (Mouton, 1996) that guides a researcher towards the achievement of the study objectives. DePoy and Gitlin (2015: 3) emphasise the need for the researcher to clearly specify actions to be followed once research objectives have been outlined. The discussion of the research process includes an outline of tangible instrumentation or social scientist tools to be

used in executing specific tasks in the research field (Mouton, 1996). This chapter discusses the research approach, design and research methods used to achieve the objectives of the study.

3.2 Research approach

Literature consulted presented three types of research approaches, which include quantitative, qualitative and mixed methods. According to Johnson and Onwuegbuzie (2004: 18) "the major characteristics of traditional *quantitative* research are a focus on deduction, confirmation, theory/hypothesis testing, explanation, prediction, standardized data collection, and statistical analysis", whereas those of "traditional *qualitative* research are induction, discovery, exploration, theory/hypothesis generation, the researcher as the primary 'instrument' of data collection, and qualitative analysis". They also describe mixed methods as a third possible approach, in which the overall research study integrates a quantitative phase and a qualitative phase to compensate for the weaknesses of each method (2004: 20). Qualitative research is inductive, meaning that it helps to discover patterns, whereas the quantitative method is deductive and therefore useful for the testing of theories and hypotheses. In mixed methods, adding qualitative interviews to experiments taps into participants' perspectives and meanings, which avoids some potential problems raised by unanswered parts of the experimental quantitative method (Johnson & Onwuegbuzie, 2004: 17-18).

According to Creswell (2014: 4), the qualitative approach explores and brings an understanding of the meaning of "individuals or groups ascribed to a social or human problem" and conducting a qualitative study becomes appropriate when a researcher needs to explore a social phenomenon. With a qualitative approach, the researcher identifies a phenomenon, described by van Manen (1990) as "an object of human experience, hence focusing on describing specific events, an adventure, a happening or a particular experience". In support of this, Nieuwenhuis and Smit (2012: 125) state that human experiences can be understood only from within, considering the human mind to be the source and origin of meaning. Understanding the social and cultural context of a community in qualitative enquiry would therefore require participation of individuals experiencing the phenomenon. A qualitative approach was considered relevant for this study since the aim is to explore perceptions, feelings and experiences of a selected community. However, in a qualitative enquiry the researcher has to further identify a design suitable for the study that informs the selection of appropriate data collection methods and

procedures in the research field. The research design selected for this study is phenomenology. Both the design and methods used in the study are discussed below.

3.3 Phenomenology research design

According to Creswell (2013: 5), research design informs the entire research process and there are several designs that have emerged and are widely used in qualitative enquiry. Phenomenological research design explores a phenomenon or experience which a group of individuals has all been experiencing (Creswell, 2013: 78). A qualitative design grounded in phenomenology is selected here since it particularly focuses on shared or common lived experiences of a concept (Creswell 2013: 76) that carries a universal essence.

The design and the theory adopted to inform the study emphasise the use of data collected in the participants' setting and from the subjects who have experienced the phenomenon (Budd, 2008: 177; Creswell, 2013: 76). Both the theory and the design have methodological aspects that suggest engaging in dialogue with subjects experiencing a phenomenon in order to interpret data from the participants' perspective. In this case, both the voice of the subjects and that of the enquirer are of significant value since one voice creates or increases awareness through sharing the realities of life and the other one works as a tool to analyse and interpret realities presented by the subjects. Therefore the methods and techniques for the study should facilitate a platform for subjects to share their experiences, and these procedures are discussed below.

3.4 Ethical considerations

Ethics clearance is a stage where the ethical implications of the research proposal and instruments are scrutinised to ensure that the planned research activities may not harm participants in any way. Organisations put in place ethics committees and codes of ethics to protect both researchers and participants from harmful research actions (Ogletree & Kawulich, 2012: 64). It is the duty of ethics committees to make sure that any proposed research commits to ethical means of conducting research. Codes of ethics may differ from one research field to the other, but it is generally agreed that measures are taken by the researcher to ensure, through maintaining informed consent, data anonymisation and confidentiality, and that no ethical difficulties are posed by the study (Ogletree & Kawulich, 2012; Creswell, 2013). It is also emphasised that participants must be informed of the nature of the study, thus avoiding

deception and encouraging voluntary participation (Ogletree & Kawulich, 2012; Creswell, 2013). Participants must also have the freedom to withdraw from participation at any point, should they feel the need to do so.

As indicated in Appendices, in the introduction section of the online questionnaire, and the consent form used during interviews, the participants of the study were informed about the purpose of the study. The researcher also indicated that the data would be used for study purposes and may be of use to other institutions experiencing a similar phenomenon. Both introductory sections of the instruments clarified that participation was voluntary with the freedom to withdraw at any point. Data confidentiality and the researcher's intention to anonymise data during analysis and archiving of data were also guaranteed.

3.5 Population and Sample

When conducting research, scientists identify a population, which is a group of persons one wants to describe in the study (Vogt, 2005: 240). In this study the population refers to all Master's students enrolled at UWC as subjects or units of the study. Although some students might not necessarily use the library services, all Master's students are considered as units of the population since the participation of non-users could also shed some light on their reasons for not using the services. Studying all units of the population has time and cost implications, therefore a sample of individuals or units to be studied has to be drawn from the population (Lather & Bother, 2012: 86) and a general conclusion made about the entire population, if possible. The weakness of generalising findings is that it may group subjects in categories that do not represent their voices and the conclusion may not be a true reflection of reality. The process of selecting units representing the population for the study requires a sampling frame, which is a list of all units of the population (Laher & Botha, 2012: 86).

Selecting subjects who have experienced the problem has a greater potential to better inform the study, thus making a phenomenological study complete, since data would be supplied by individuals who have experienced the phenomenon. Such a sampling method is also in harmony with critical theory (a theory selected to inform the study) since the theory encourages collection of data from subjects experiencing or with wide knowledge of the phenomenon under study. However it is important to note that the researcher's philosophical assumptions, experiences and educational background also influenced the selection of samples used.

UWC has seven faculties comprising different departments (UWC Faculties, 2013) and every faculty enrols Master's students. Collecting and analysing data from the target population would have been costly and time-consuming, therefore the researcher selected two groups from the site as units of data collection using purposive sampling, also commonly known as judgemental sampling (Kumar, 2011: 207; Laher & Botha, 2012: 93). This sampling method is "often accomplished by applying expert knowledge of the population" (Battaglia, 2008: 645). With purposive sampling, individuals could be selected as data collection participants because they "can inform an understanding of the research problem under and central phenomenon in the study" (Creswell, 2013: 156) or "they can provide best information to achieve the objectives of the study" (Kumar, 2011: 207). Both criteria identified above were used as guidance to select samples for the study.

The first group of participants consisted of Master's students from the Faculty of Arts and the sample is part of the target population experiencing the phenomenon under study. The researcher selected UWC Faculty of Arts with the assumption that subjects from the Department of Library and Information Science, which is housed in this Faculty, would add great value to the discussion since electronic services and the digital divide are information science subjects, and both relate to information dissemination. However, the survey was developed in a language that enabled subjects from other departments to supply data relevant to the study as well. The selection of a single faculty does constitute a limitation, as it cannot be assumed that students from all faculties have equal information needs and skills. However, the Faculty of Arts maybe regarded as a reasonable sample for the scope of this study as it has the largest number of departments, which could suggest that it represents diverse cultures, philosophies and variation in experiences and perceptions. These factors were regarded as useful in eliciting data of varying user experiences and perceptions about the phenomenon under discussion.

A sampling frame is typically applied in the case of random sampling, since the researcher needs to consider every member of the population. In this study, which used purposive sampling, the researcher requested a list of all Master's students from the Faculty of Arts as a sampling frame for the purpose of communicating with participants. The site supplied a list of 289 units. The sample indicated a representation of both part-time and full-time students from the various departments of the Faculty of Arts. The list also included local and foreign students, which confirms the diversity of cultures in the sample. Table 3.1 describes the sample accessed

from the site. However, it was discovered from the data collected that some of the units from this frame were PhD and Honours students.

Table 3.1: Description of the sample used in the survey

Sample description	Representation
South African Students	224
Foreign National Students	64
Total Sample size	289

Considering the history of the institution, the researcher made an assumption that any sampling frame supplied by this particular institution should have black students and those previously designated as "coloured" from historically disadvantaged, low-income family backgrounds as dominant units, since UWC has a history of attracting students from such backgrounds because of its anti-apartheid and multi-racial accommodative nature. The institution had always played an emancipatory role, offering adequate educational services to the low-income and non-white South African communities as compared to the historically white universities. According to Sehoole (2005: 40), UWC had also accommodated students who fled police harassment and were excluded from other universities during apartheid. This accommodative nature had given the institution the nickname of "intellectual home of the left" during apartheid (Sehoole, 2005: 40). However, there was no evidence to confirm that the units from the frame were mainly 'previously designated as "coloured" and black' students, and subjects from any other faculty within the site would potentially have been equally useful as units for data collection.

With guidance from literature, the researcher considered the importance of using a reasonably large sample and decided to include all the units on the list supplied by the site as data collection participants without further sampling. Lather and Botha (2012: 89) argue that, since the purpose of qualitative research is to explore the range and nature of views and experiences, a limited sample will not be conducive for this purpose, although other important factors need to be considered during sampling. They also clarified that "the larger the sample the more representative it is of the population" (2012: 87) and the emphasis on large samples is viewed as a means to make up for low-response biases (2012: 88). In a situation where very few participants respond to questionnaires, data collected may not truly reflect the reality of the matter.

The second group from which data was collected consisted of selected staff members from UWC library who are experts in information services who also interact with the electronic services as they assist users. In this case librarians were not necessarily selected because they are part of the targeted population, but rather for their wide knowledge about the experiences of the population. The researcher's prior experience also recognises that librarians have adequate knowledge to inform a study on users' experiences with library services, since they interact with the population as service providers and trainers who impart skills to the members of the population struggling to fully utilise library services. It is also the librarians' responsibility to evaluate the quality of library services (Nitecki & Hernon, 2000) and find means of improving services being offered, and to identify members of the population with specific training needs along the way.

3.6 Data collection instruments

Literature extensively discusses data collection methods suitable for phenomenological qualitative research methods and these emphasise that data should be collected from subjects under study. A survey questionnaire, reproduced in Appendix A, was designed to gather data from a sample drawn from the target population, and interviews (see interview guide, Appendix B) were scheduled in order to gather data from a different sample group, viz. librarians, selected as experts holding accurate data about the phenomenon and subjects under study. Data collection commenced on 20 April 2015 and ended on 20 May 2015, and was completed within schedule, despite initial delays in communicating with participants.

3.6.1 Interviews

A summarised range of interview techniques presented by Creswell includes a) face-to-face with individuals, b) interrogation of a focus group and c) telephone conversation (2009: 179). According to Kumar, an interview is any interaction, either face-to-face or otherwise, between two individuals or more with the intention of engaging in a process of asking questions and getting responses in a flexible or inflexible way (2011: 144) in order to understand a particular subject. Interviews provide rich data as they allow for exploration and allow researchers to obtain an understanding of the environment by establishing core reasons for particular problems.

Interviews can be further categorised into structured and unstructured interviews. Unstructured interviews give the researcher the freedom to order questions in any sequence, so long as all themes are covered, and flexibility with wording of questions (Kumar, 2011: 145). A structured interview uses a predetermined set of questions with exactly the same wording and question order as specified in the interview schedule (Kumar, 2011: 145). An interview schedule is a list of either open-ended or closed questions that will be used as a guide or checklist by the interviewer (Kumar, 2011: 145) to ensure that all themes or questions are covered. In this study the researcher adopted the unstructured type of interview using a face-to-face technique without following a strict order of questions. Some answers for listed questions were obtained during the discussions before the interviewer had asked the questions, and there was therefore no need to repeat questions that had already been answered.

Use of face-to-face interviews has its own disadvantages: interviews may fail to collect the required data if the questions are too long and complex, and interviewees might not openly discuss issues relating to their organisation if they fail to trust the interviewer. The same may happen if the interviewer does not listen attentively to the conversation and constantly ask interviewees to repeat responses. During interviews the researcher answered questions pertaining to the choice of site in order to iron out any mistrust from interviewees. The researcher also made use of a voice recorder to avoid asking interviewees to repeat responses thereby disrupting the flow of conversation.

3.6.2 Questionnaires

Questionnaires are a convenient and cost-effective method useful for collecting data when the sample is large (Mentz, 2012: 101). The researcher made use of the license-free component of SurveyMonkey, a Web questionnaire design and management service, to design and distribute the online instrument, and to collect responses from the first group of participants. In most cases questionnaires are classified as quantitative data collection instruments but in this study a questionnaire was adopted and designed to create a platform that would solicit predominantly qualitative data. Kumar (2011: 145) argues that interviews and questionnaires work in a similar way, the only difference being that in the case of interviews the researcher reads the questions out loud whereas with questionnaires the respondents read the questions themselves. The assumption in the use of questionnaires is that participants would give accurate reports about their experiences and perceptions so that the researcher may gather a description of the nature of the environment. The use of questionnaires was considered essential in gathering honest and

accurate data since questionnaires facilitate "the greatest possible anonymity" (Mentz, 2012: 101). However, there are several disadvantages associated with the use of questionnaires. Questionnaires are likely to gather unintended responses if the questions are ambiguous or biased. Respondents may fail to interpret the intended meaning in questionnaires since the researcher is not present to clarify questions. It is also generally agreed that response rates for questionnaires are typically very low (Mentz, 2012).

3.6.3 Pre-test

Researchers are encouraged to test instruments before using them in the field for data collection, in order to critically examine if the respondents would clearly understand every question (Kumar, 2011: 158). In this case the population that participated during pre-test would not contribute to data collection because the pre-test participants are only assisting in the identification of ambiguity and clarity issues that may pose challenges to those identified as actual research units. The researcher conducted a pilot survey using peers from her own institution and gathered feedback that helped to improve the quality of questions. Pre-tests were conducted for both instruments used in the study, and no members of the samples from the selected site participated in pre-tests. Reliability is viewed as the probability that identical or similar results would be produced if a research procedure or method is repeated (Bush, 2007: 92). In a qualitative study of this nature, reliability is generally secondary to validity, given the subjectivity of participants and the unique context in which the instruments are applied.

3.6.4 Data validity

The use of combined instruments in collecting data is a multi-strategy or triangulation means of validating data collected (Guion, Diehl & McDonald, 2011: 1). Two instruments, questionnaires and interviews, were used on two different samples to provide points of data convergence that would facilitate grouping of data by themes to enhance research findings. The instruments were designed with similar themes and questions were derived from the research objectives to enhance validity of the study.

3.7 Analysis of data

Data analysis in qualitative research follows a general process of preparing, organising, coding and condensing of either text, image or audio data collected, and then making a decision on whether the data would be represented in figures, tables, discussion or represented using combined means (Bassett, 2010: 192; Creswell, 2013: 180). Using a computer to analyse data would be more convenient than hand coding, since available computer programmes reduce the challenges of dealing with voluminous data collected (Creswell, 2013: 183). The data analysis process also includes a thorough read-through of the database for sense-making of the data, which would assist the researcher to describe, classify and interpret data into codes and themes. According to Schwandt (2007: 32), coding is the grouping of data into meaningful and manageable segments or categories and the naming of these segments. The codes are later combined into broader units or categories known as themes. According to Creswell (2013: 184) the formation of codes and themes "represent the heart of qualitative data analysis".

In this study data collected was processed and analysed with the aid of SurveyMonkey and NVivo computer software programs. The choice of the computer programs was made on the basis that the SurveyMonkey is freely available and NVivo is readily installed on computers at the researcher's institution. NVivo operates on a PC/Windows platform (Bassett, 2010: 192) and its streamlined look makes it easy to use as it securely stores the databases and files together (Creswell, 2013: 204). The software also allows for the manipulation of data (Creswell, 2013, 204) through permitting the transcribing, coding, combined searching and retrieving of data (Bassett, 2010: 192). The researcher transcribed, retrieved and coded interview data using manual components of NVivo software and the survey data was electronically collected and automatically analysed through the SurveyMonkey questionnaire Web management service. The NVivo software facilitated the process of incorporating small segmented data themes into major data themes. The use of figures, tables and discussion in text form was adopted as a means of presenting data collected for this study in Chapter 4.

3.8 Summary

This chapter presented reasons for the use of an online survey and interviews to collect data for this study. The discussion included reasons why a qualitative research approach and research design grounded in phenomenology were regarded as useful to inform the study. Procedures followed to access the site and units of data collection were discussed, including ethics and

reliability considerations as well as pre-test activities. The researcher also discussed some assumptions that informed decision making during data collection process. The next chapter presents the findings from data analysed in NVivo and SurveyMonkey.

Chapter 4: Analysis and Presentation of findings

4.1 Introduction

The previous chapter outlined the methods that guided the researcher in collecting data for this study. This chapter presents the findings of data collected through an online survey and interviews. Postgraduate students from the Faculty of Arts at UWC completed an online questionnaire which was administered and distributed using the SurveyMonkey tool. This tool was useful in collecting, analysing, and tabulating the online survey data, whereas data collected from interviewees, selected UWC librarians, was analysed using NVivo.

The main objective of the study was to determine if efforts made by UWC academic library to bridge the primary and secondary digital divide were perceived as effective. Specific research questions were generated from the sub-objectives of the study and these guided the discussion that intended to address the main objective of the study. Questions from both the online questionnaire (Appendix A) and interviews (Interview guide, Appendix B) were drafted to solicit data that provided insight on the use of electronic infrastructure and services, user perceptions of the services, availability of adequate skills to make use of the e-services, satisfaction of information needs by the library e-services, and also challenges encountered by students as they interact with electronic services provided by UWC library. These two instruments were designed with similar themes to allow for the use of different instruments to enhance data validity. The instruments gathered data that demonstrated perceptions from the two samples selected using purposive sampling. Each instrument included questions that directed the discussion towards the following main themes: a) infrastructure and services, b) bandwidth, and c) skills. Below are the specific research questions of the study:

1. How often do Master's students at UWC make use of the electronic infrastructure in the library or on campus and what are the reasons for using the infrastructure?

2. Do the library e-services at UWC meet the information needs of the Master's students?

3. Has UWC library established and incorporated skills programmes that improve the use of electronic services by Master's students?

4. What challenges are encountered by Master's students when interacting with the electronic services offered by UWC library?

4.2 Description of data collection sample

As indicated earlier, UWC was selected as a site on the basis that it had many issues to deal with after apartheid, including inadequate educational infrastructure - which contributes to the digital divide - since it is among the historically disadvantaged academic institutions targeted at people of colour. The researcher's rationale for sample selection has been explained in detail in Section 3.5. A link to a questionnaire was distributed via email to a list of 289 Master's students, provided by the research officer from the site. Six UWC Library staff members were interviewed.

4.3 Data presentation

Data collected is presented grouped by various themes drawn from the data. It has been noted that questionnaire respondents did not exhaust every question posed, neither did all interviewees give detailed responses for every question asked. For some questions, online survey respondents had an option to give more than one answer. However all data was analysed and findings are presented in tables, figures and text in the sub-sections below.

4.3.1 Description of participants

This section presents findings from both the online questionnaire respondents (postgraduate students and interviewees (six librarians). The questionnaire only yielded 40 (13.8%) responses out of a sample size of 289 units, despite the use of email reminders in an attempt to maximise responses. Despite this low response rate, the data yielded was sufficiently rich and valuable to respond to the critical questions of the study. Data from 37 (12.8%) respondents was regarded as meaningful, the remaining three units only shared their level of study and indicated that they never used computers in the library and shared no further experiences or perceptions. During data presentation *N* will represent the total number of respondents, excluding non-respondents for that particular question. The interviewees have been anonymised for ethical purposes. Ten questions were prepared for both questionnaire and interviews. The interview responses are incorporated into the themes to triangulate data and observe variations in views of students and librarians. Table 4.1 summarises the levels of education of the online survey respondents. The researcher had requested a list of Master's students from the site, however it is interesting to note the variations discovered from the frame supplied by the site.

Nevertheless, responses from other levels of study were equally respected since these could still provide an insight on the phenomenon, the researcher therefore analysed all meaningful data.

Table 4.1 Respondents by level of study

[N=37]

Level of Study	Total	
Undergraduate	0	0 %
PGDip/Honours	3	8.3 %
Master's	25	69.4 %
PHD/Other	8	22.2 %
Level of study unknown	1	2.7%

4.3.2 Perceptions of the digital divide

The first question required interviewees to share their perception of the digital divide. The purpose of this was both to identify if interviewees were aware of the phenomenon under discussion and also to note if there are other aspects of the concept of the digital divide that have evolved in the course of the librarians' experiences with the users. Views from librarians include:

i. Access to ICTs and internet connections

All interviewees associated the digital divide concept with technology and some indicated that it is the lack of access to Information and Communication Technologies (ICTs) that creates this divide. One librarian specified that the divide refers to a lack of electronic devices, like computers, laptops or iPads to access information or to communicate with others, and another interviewee emphasised that this is as a phase in which libraries are shifting towards making services digitally available to students as far as possible. One librarian views the digital divide as a gap in access to information technologies and of understanding information technologies among various people, and those lagging behind in using information technologies encounter challenges in accessing information online. For this librarian, the digital divide is a phenomenon experienced everywhere, but the impact varies with individual situations. Another

emphasised the issue of access to the internet as she noted that many students are not privileged to access information online and it is an issue of great concern since this contributes to the digital divide. She further indicated that students with no access to the internet lack information literacy skills because their access to online information is also limited [hence, lack of search practice]. She emphasised the need for academic libraries to try and alleviate the problems encountered by those students who have no internet access.

Two interviewees argued that the digital divide concept is contextual and within the context of South Africa it takes on particular meanings. For one of these librarians, this constitutes lack of access to ICT infrastructure and internet connectivity in many parts of the country. She further explained that there is no [internet] access in schools, which can stand as central points for people (South African communities) to access information technology. Three interviewees indicated that experiences of the digital divide are said to be more pronounced in rural schools since they do not have computer labs, access to other hardware and Wi-Fi. One of them indicated that, most rural schools might acknowledge the need to offer computer classes more, since there is minimal exposure to ICTs.

ii. Use of smartphones

One librarian argued that the use of cell phones (smartphones) is indicated as an alternative means to information access where there are no computers, but that is also dependent on having money to buy data [bandwidth], not only for sending short messages and talking but for information searches of any depth, because data purchase is not cheap. Therefore for her, the digital divide is a phenomenon with so many permutations because it differs between individuals. Smartphones were considered by one librarian to be of great value in implementing matrix barcode (Quick Response code or 'QR' code) projects, but the challenge is that users may not be able to afford the software required to read the code. Another concern raised by other librarians is that users may not be able to afford to constantly upgrade their smartphones, which rapidly become obsolete.

iii. Education and Language

Two librarians pointed out that users contribute to the digital divide themselves by lacking interest to learn more about emerging technologies and how these can be applied academically. They noted that some users have the information technologies but they do not put in any effort

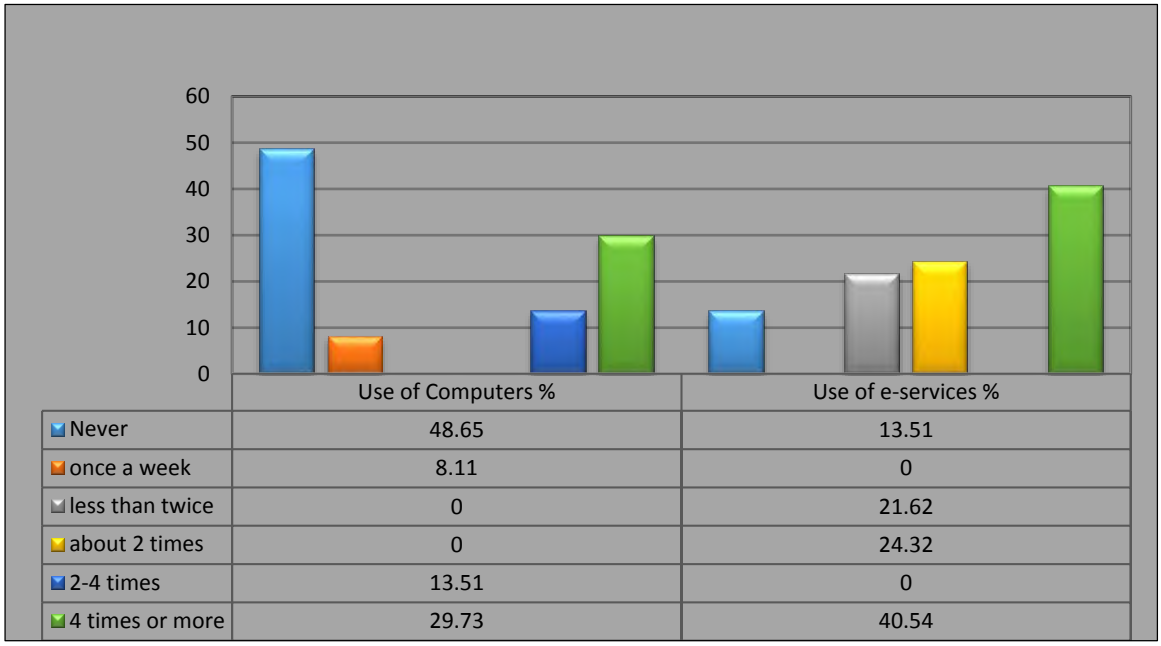
to learn how [various features/applications of] these devices work. One interviewee emphasised that wide discrepancies in levels of education are factors exacerbating the digital divide, since [individuals with] higher levels of education make more use of information technologies. The interviewee further explained that English is not first language for many South Africans, and this contributes to the difficulties people encounter in accessing information. Language can therefore be seen to be another contributing factor to the digital divide.

4.3.3 Use of infrastructure and e-services

Two questions (2 and 5) were asked of students to determine the extent of usage of networked infrastructure (computers, internet and printers) and e-services (emails, databases, referencing managers, social media, etc.). Figure 4.1 summarises the frequency of use of both networked infrastructure and electronic services. It is interesting to note that in most cases the frequency in use of UWC electronic services is higher than that of library networked infrastructure. This might be a reflection of the dependency on the library's e-services by those with personal devices. Most librarians noted that users may frequently use the ICT infrastructure on campus since most of them cannot afford personal computers, however one librarian indicated that most Master's students possess laptops. All interviewees agreed that most users, including those with personal laptops, frequently access e-services offered by the library and some librarians indicated the reason that most users cannot afford internet bandwidth at home. Figure 4.1 shows high frequency in use of e-services by the largest number of users.

Figure 4.1: Use of Computers & E-services

Use of Computers: [N=37] Use of e-services: [N=37]



	Use of Computers %	Use of e-services %
Never	48.65	13.51
once a week	8.11	0
less than twice	0	21.62
about 2 times	0	24.32
2-4 times	13.51	0
4 times or more	29.73	40.54

4.3.4 Reasons for use of infrastructure on campus and related challenges

Two separate questions were asked of students to establish why users use the networked infrastructure in the library and to identify the challenges encountered while interacting with services offered. Responses to these questions are summarised in Figure 4.2 and Figure 4.3. For both questions, respondents selected responses from options supplied and those that selected the option "other" had to provide reasons. Some of the specified reasons for using the infrastructure were: the efficiency of library networked computers as compared to connecting personal devices to the internet though the institution's Wi-Fi, and the convenience of avoiding travelling with a laptop for security reasons. One response noted that campus PCs allow students to be productive during free time between lectures and to access library articles/books. Some librarians and questionnaire respondents noted that internet access via laptops on campus is slower than via desktops.

Figure 4.2: Reasons for using infrastructure

[N=22]

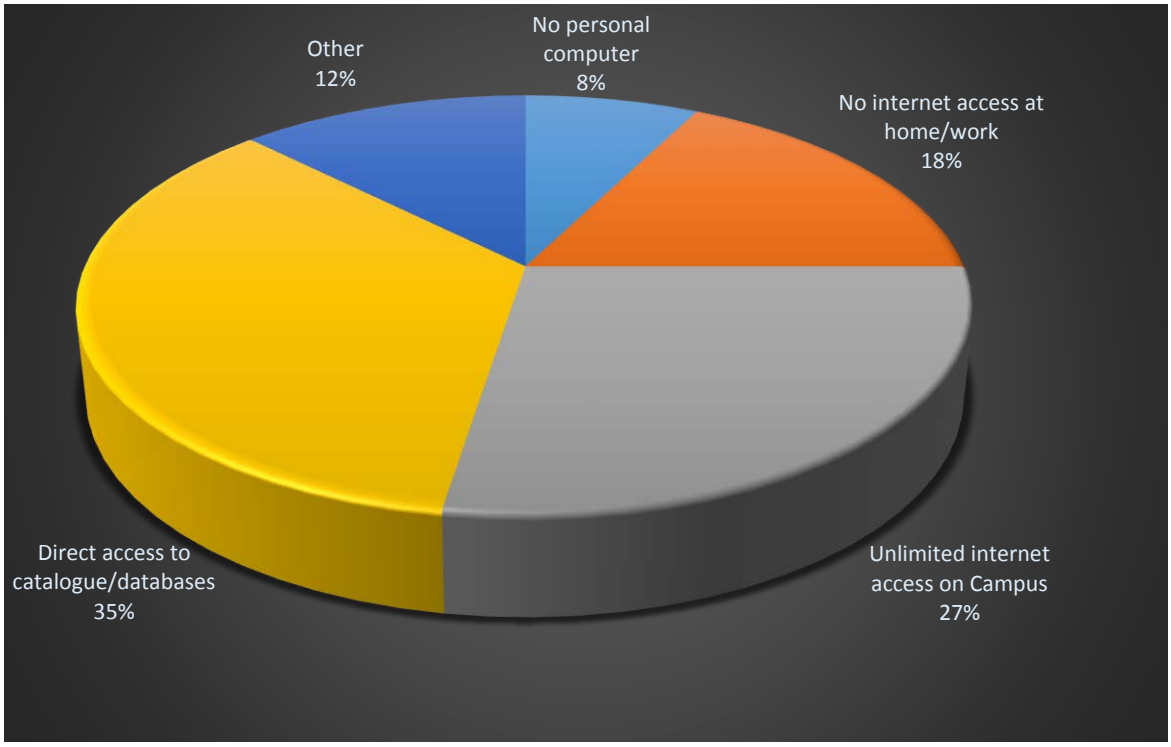
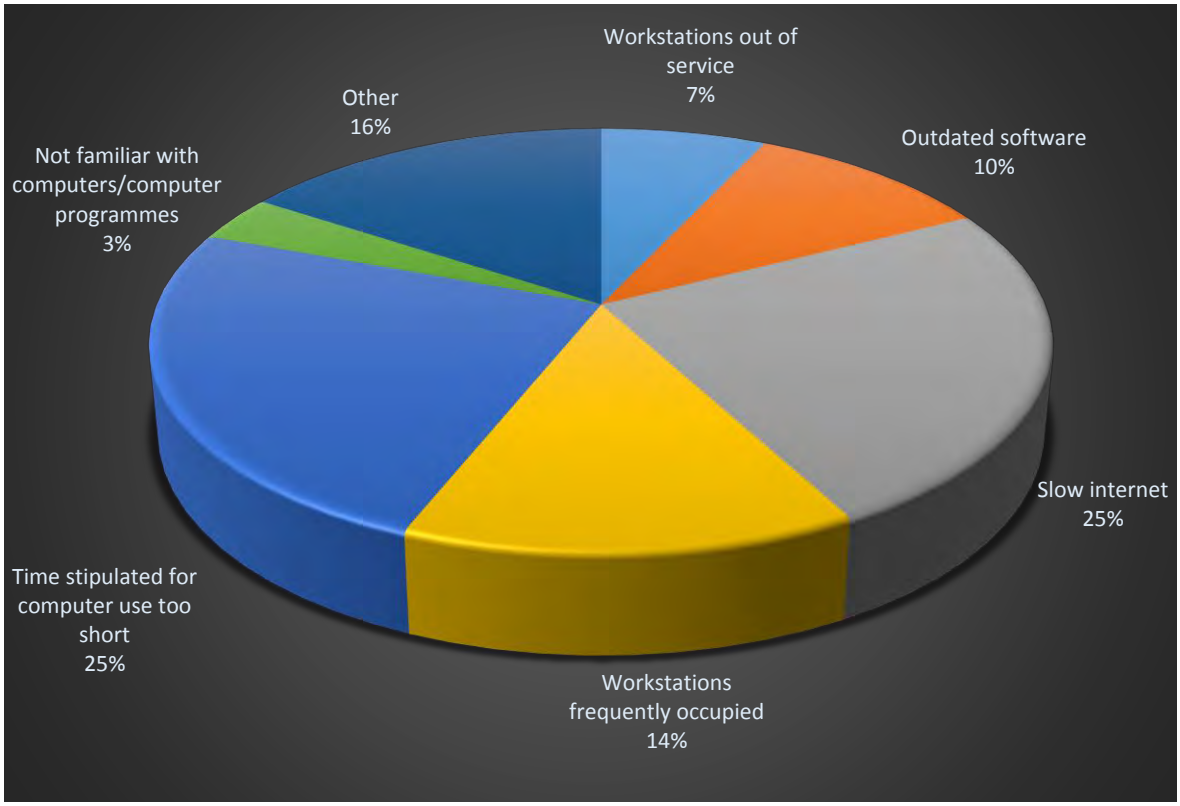


Figure 4.3: Challenges encountered

[N=25]



Some librarians acknowledged that internet access on laptops is limited to specific hot spots and some users indicated that they use fixed PCs on campus because they enjoy the atmosphere in the postgraduate labs at the students' residence and in the library. All interviewees mentioned the availability of free internet access through library computers and computer labs. On the contrary, two interviewees also noted the slow internet connection on campus. The internet speed is said to have improved over the years but other librarians acknowledged that there are moments when the internet is extremely slow, to the extent that users can barely open a resource online or access other electronic services. Other challenges related to acquiring and use of technological infrastructure are discussed below:

i. **Security issues**

Some of the interviewees noted issues of security on campus, which confirms the reality of the fear noted by a respondent who avoids carrying a personal laptop from home as a security measure. They shared an incident experienced by UWC library in early 2015, when electronic devices acquired for loan to users who cannot afford personal laptops were stolen from the

library. Three interviewees raised a concern that, although the iPad and laptop loaning projects planned by the library would be of great value to support underprivileged users, the projects are still high-risk since the devices can easily be lost or stolen. They then indicated the need to insure the devices, which neither the users nor the library can afford.

ii. **Economic issues**

Most interviewees acknowledged that the institution attracts students from mixed backgrounds, with the majority of students coming from low-income communities that cannot afford personal ICT infrastructure, including internet data to access online information off campus. All of the students are said to have differing levels of knowledge in using digital devices since among the disadvantaged some have little exposure to electronic devices. Therefore the library constantly proposes projects that can help to alleviate the existing challenges. Three of the interviewed librarians agreed that most of their users depend solely on the internet on campus since internet connectivity at home poses huge affordability challenges. There was also a general agreement that there are a few postgraduate users who can hardly use computers, especially those coming from low-income communities in the locations[2]. Three librarians also noted that most of the users with little or no exposure to electronic devices are foreign students coming from less privileged and economically challenged countries that cannot afford ICT infrastructure, including internet connectivity [to promote computer education]. Two librarians shared that they have recently encountered some mature postgraduate students struggling to use computers and one of them could barely use a mouse. One librarian had a discussion with a South African user confessing that they do have computers in their local area but they are locked away because teachers at their local school do not have the requisite knowledge to use the equipment. This is a good example of the exclusion of some South African communities from access to digital information. While the infrastructure is available, the lack of trained teachers to impart skills to operate hardware has exacerbated the digital divide. This creates an opportunity for UWC library to fulfil its emancipatory role for such excluded individuals.

Librarians shared their knowledge of solutions that have been put in place as a way forward by UWC library. Two interviewees pointed out the existence of lab assistants who support students struggling to use computers. Two interviewees noted the availability of the Knowledge

[2] The term location is used in South Africa to refer to high- density suburbs and informal settlements designated as “non-white” living areas under apartheid.

Commons (KC), a facility with computers available for use by any students and a team employed to support those struggling with the basic use of computers. They also noted that all the computers in the labs and those in the KC are connected to the internet, fully paid for by the university. Most of the interviewees also noted the availability of free Wi-Fi on campus to cater for those who need to connect to the internet with personal electronic devices. The computers on campus are connected to printers. As noted by one librarian, printers are a major need for both undergraduate and postgraduate students, particularly toward the end of semester when printed exam projects are due for submission.

All of the librarians noted that the challenges encountered by students are identified and improved upon as the year progresses through information literacy classes and other research clinics scheduled for postgraduate students on Thursdays and Saturdays. These programmes are spread throughout the course of the year to accommodate students of various needs. However one librarian pointed out the difficulty of eradicating the digital divide entirely because attitudes towards learning and challenges encountered are not homogenous.

iii. **Language-related challenges**

The language barrier has been noted to be an issue contributing to failure to interact with computers, since English – a language widely used on the Web – is not the first language of many students. Two librarians noted that some users encounter challenges because they do not understand English properly, particularly local students coming from rural high schools and international postgraduate students coming from non-English speaking countries. Another librarian also highlighted that, as English is not the first language for most students, it is challenging to use it as medium of instruction to train users and develop skills to search through the [information] databases. The general feeling is that training of those who do not understand English well will not be successful because of communication barriers, nevertheless the information needs of these students are no less critical, if not more so. One librarian expressed that although these constitute a small percentage of the postgraduate population at the institution, they still need assistance and support from the librarians, which might not be practical unless the users take English classes. One librarian emphasised that the idea of mixing users of different levels of understanding in one training session also disrupts continuity of the sessions and frustrates others, since trainers have to adopt a slow pace to cater for those facing communication barriers. Another librarian described this as a difficult problem to solve, as the

challenges begin with the filling in of evaluation forms that help librarians to identify the training needs of users and the effectiveness of the training at the end of the session. Forms submitted by users with communication barriers in most cases are said to lack coherence and meaning, hence an ongoing communication barrier in the training session since the trainer cannot identify what they need. However some librarians acknowledged the availability of English classes for beginners at undergraduate level but they were they were not sure if postgraduate students facing language barriers can be accommodated in these classes.

iv. **Lack of learning interest**

Two librarians shared perceptions that the nature of the divide currently being experienced can be classified as a "mental divide". They both agreed that the negative attitude that users have toward experimenting with electronic devices is exacerbating the digital divide in academic institutions. They shared the sentiment that lack of individual effort to learn increases the challenges encountered with access to online information. Some individuals fail to do small tasks like frequently checking emails in order to keep up to date with daily academic business. The argument for these two librarians is that, although students lack exposure to electronic devices because they cannot afford to purchase laptops, when an opportunity arises some of the disadvantaged users still show no interest in interacting with new technologies that present them with new opportunities.

v. **Limited electronic access to peer-reviewed resources**

The main problem noted by librarians in trying to accommodate the different needs for users in this digital era was the challenge of access to high quality research articles due to exorbitant journal subscription fees. They noted that libraries in South Africa are struggling to keep up with the payment of database subscription fees to allow user access to a variety of quality peer-reviewed scholarly content.

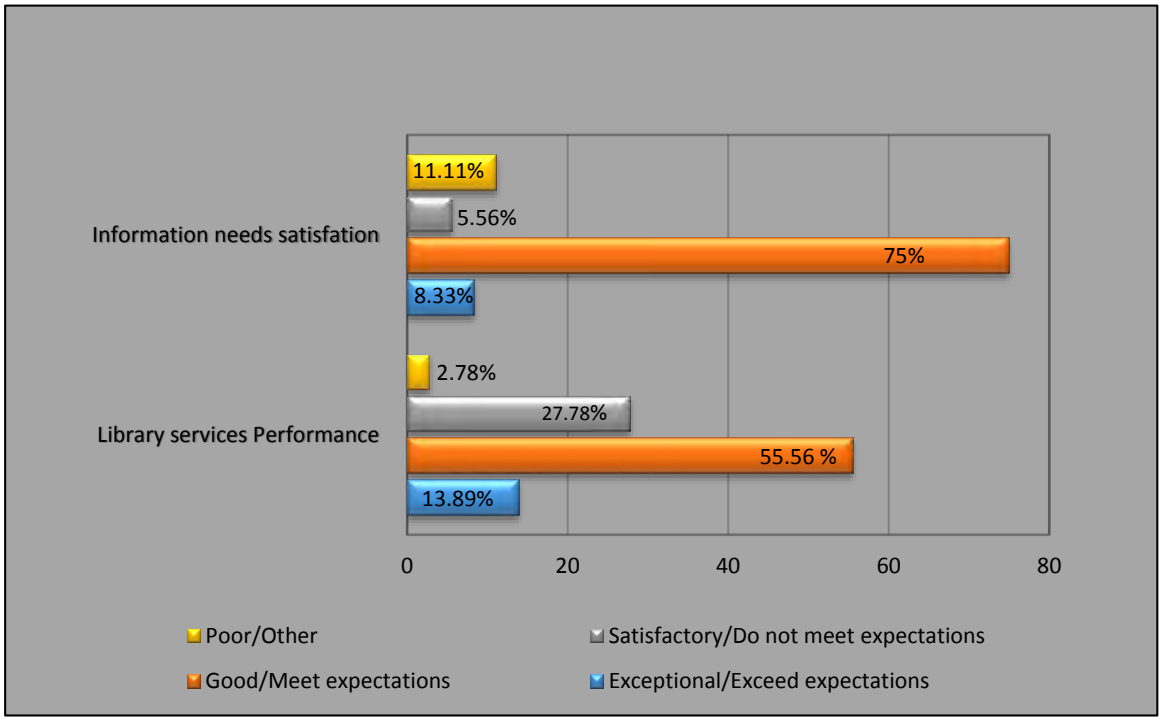
4.3.5 Information needs and library services performance rating

One question in this theme intended to find out if users appreciated the performance of the library services and the other probed if the library e-services meet the users' information needs. Figure 4.2 summarises the responses. The rating of library services also solicited more data

through the "Other" option. One respondent stated: "I don't know, I've never been", which could suggest the student has never been to the library. A different response stated: "I am not well informed about this" and another read: "finding books meets expectations but the online journals/articles are often faulty and don't open. I often I (sic.) have to find other means of obtaining them". Similarly, one interviewee also raised the issue of broken links and messages when they try to open links to resources, especially guides or tutorials prepared for users on campus.

Figure 4.4: Information needs & services performance rating

Needs satisfaction: [N=36] Service performance rating: [N=36]



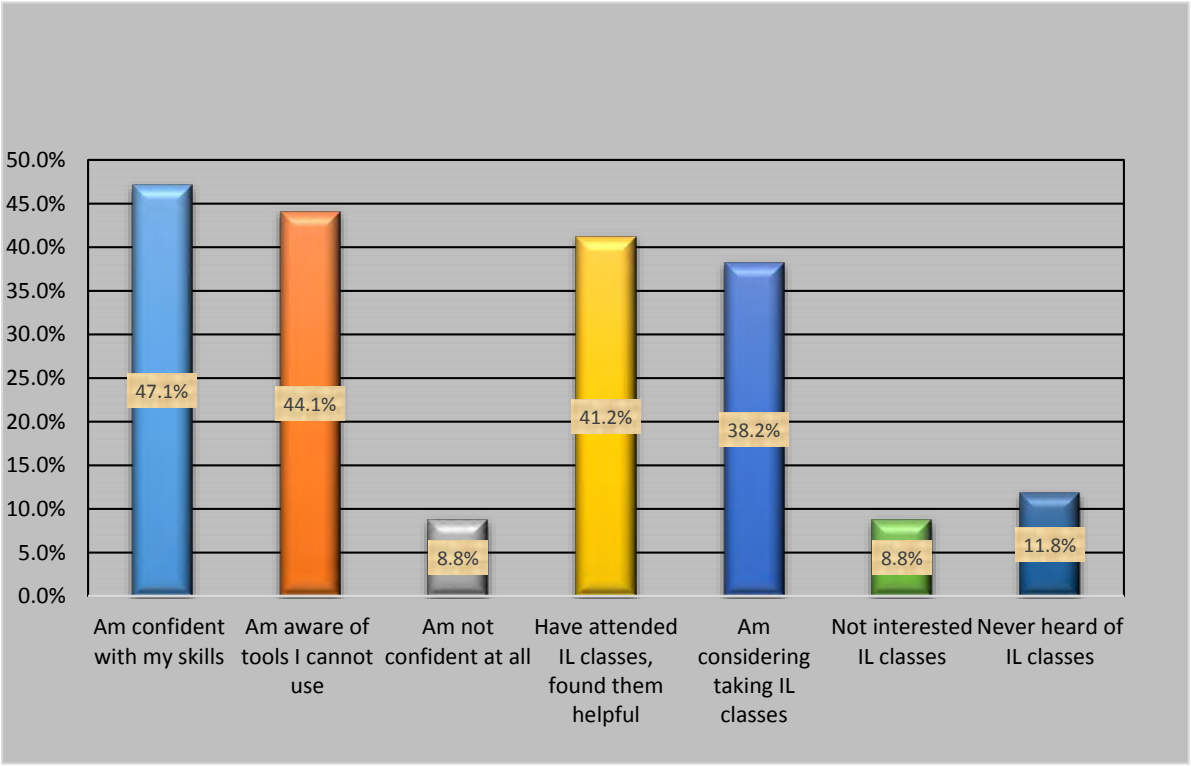
4.3.6. Perceptions of skills and information literacy (IL) classes

Figure 4.4 summarises the survey responses to rating of individual information literacy (IL) skills and the need to attend classes to improve these skills. In support of some issues depicted in the chart, interviewees noted that some postgraduate users are not only computer illiterate but also lack information literacy skills. Most librarians acknowledged that some Master's students do not fully utilise the available e-services for various reasons. In previous sections, librarians have acknowledged various factors influencing the experiences of the digital divide

by some postgraduate students, and some of these factors affect the acquisition of skills to identify, analyse, evaluate and find information that satisfies their needs. Two librarians acknowledged that some adult students and others who graduated prior to the use of online library information systems even encounter challenges in locating print resources and finding information through the library's online catalogue. The latter issue was further supported by three librarians with information/reference desk experience. They pointed out that they observe expressions of concern from some returning students as librarians demonstrate the online catalogue.

Figure 4.5: Perceptions of skills & IL classes

[N=34]



Factors identified by various librarians as contributing to individual failure to exhaustively use electronic services offered by the library included: lack of computer skills for some individuals, aggravated by lack of exposure to ICTs and low income backgrounds, and thus lack of individual possession of electronic devices, language barriers, lack of domestic internet access, and lack of awareness of the availability of services like e-resources, referencing management tools and others. They also attribute low awareness of the information literacy training programmes offered by the library to individuals missing orientation and announcements.

Some librarians indicated poor awareness among postgraduate students of the availability of e-Books, electronic theses, tutorials, self-study guides and other services like online bookings for training. They also confirmed that for some postgraduate students it is a challenge to differentiate resources accessed online, especially for referencing purposes. Most of these issues are discovered when postgraduate students approach the reference desk accidentally. UWC library has therefore established information literacy programmes to help those lacking IL skills. One librarian indicated that UWC library is working collaboratively with other academic institutions through Library and Information Association of South Africa (LIASA) to establish an adequate information literacy curriculum for South African higher education students to promote lifelong learning. Information literacy librarians will then be embedded into faculties to impart adequate information literacy skills to students. All interviewees and some of the students confirmed the availability of the IL programmes offered by the library. Two librarians also mentioned the training support for reference management systems, included in the training sessions offered to postgraduate students.

4.3.7 Resource sharing networks

Question 10 was intended to identify other sources used as information sharing platforms when users struggle to find information. This helps to identify if there are individuals who find no solutions at all when searching for information. This question yielded 28 responses and most of these indicated the frequency in use of the internet to access information through various search engines, databases, and social media platforms, which indicates that social networking is also valuable in accessing scholarly content from outside UWC databases. Twenty-three percent of respondents indicated that they access content via Google Scholar. Five respondents indicated the use of resources from other institutions such as the University of Cape Town and Stellenbosch University, which may reveal the use of interlibrary loan facilities among the Western Cape higher education libraries. The National Library of South Africa was notably among those outside libraries that some users depend on for resources. Some students indicated use of personal resources to purchase and access e-books, which is an option if one has the financial resources.

4.3.8 UWC library's initiatives to bridge the digital divide

All interviewees agreed that UWC is taking initiatives to bridge the digital divide and they were all prepared to share insights on the projects being implemented and some newly proposed ones. Some of the projects have been mentioned in themes discussed earlier and other initiatives are discussed below:

i. **Access to resources initiative**

Librarians agreed that ownership of electronic devices by users may be a problem, and one librarian noted the e-reader project established in 2014, which facilitates the loaning of electronic devices to download and read electronic books. She also specified the implementation of the QR code project in which a quick response code is generated to allow a quick scan through resources using smartphones, provided the phone has the software required to read the codes. She noted that this facility was an advantage to users without personal laptops. In addition, it was noted that the library also generated QR codes for its orientation materials in order to equip users who miss the library's orientation week. The QR code project has been described as 'information access at the point of need'.

Smartphones are not a library project, but two librarians noted that there has been a major effort by users to acquire smartphones for their personal use, and this was also a relief to the library since it can also incorporate personal cell phones into various academic activities. The librarians explained that users with smartphones have managed to use them for academic support, not only with the QR code project, but also for general accessibility to important academic information (including online resources), and access to relevant social media and emails. One librarian indicated the design of a new portal on the library website for easy accessibility to e-resources and other essential research support materials by postgraduate students and academics, and she acknowledged that the library has received positive feedback in this regard.

ii. **Training and workshops**

All of the interviewees noted the that UWC library facilitates research clinics on Thursday nights and workshops on Saturdays that are intended to assist postgraduate students to improve search skills, finding of information and general use of the internet. They also indicated that

UWC library offers courses to students from less privileged communities who have had no opportunity to interact with electronic devices. Three librarians highlighted that assistance personnel in computer labs and the Knowledge Commons in the library show students how to use a computer, thereby addressing one skills aspect of the digital divide. Training programmes include iPad training and computer literacy skills training, and some of these training interventions and clinics are ongoing throughout the year. Programmes scheduled are advertised on the library website. Every Thursday the training with postgraduate students begins with knowing the library, then basic search skills, and training builds upon previous lessons. One interviewee explained that the training programmes are planned in conjunction with the Faculty Postgraduate Office at the beginning of the year and consultations and collaborative work between the postgraduate office and the library continues throughout the year. All interviewees indicated the availability of individual training sessions offered to cater for individual challenges and author workshops to prepare research students for publishing of scientific research. One librarian noted that UWC library also has training programmes that aim to equip academics in using emerging technologies, for instance, the use of internet-enabled presentation tools to create and deliver lectures.

The information literacy librarian also emphasised that UWC library has introduced the embedding of information literacy in teaching and learning with the intention of equipping students to think critically, debate without just consuming information passively, and become conversant within their disciplines, thereby contributing to knowledge creation. Two interviewees have noted that "computer literate" is one of the UWC graduates' attributes because of the intensity of literacy programmes on campus, although one of the librarians wondered if users are indeed lifelong learners with adequate information literacy skills. Users might not be well skilled but most librarians noted the richness of the library's training package, which includes information search skills programmes, information sharing skills and referencing clinics. It has also been noted that reference management tools like RefWorks and Mendeley have been introduced in order to promote easy referencing.

It has been observed that the library works collaboratively with other partners like DigiCape and Core (both experts in technological devices), who have previously supported iPad training at UWC. Other departments have been commended by one librarian for their outstanding typing programmes. The same librarian mentioned programmes like the Digital Academic Literacy (DAL) offered by the Faculty of Economics and Management Sciences as support for students to learn various applications and how to apply them as business and economics tools.

iii. Learning Management Tool

Some librarians noted that, UWC has established Ekamva, a learning management tool used by both students and academics for communication purposes. The platform has been useful in promoting e-learning activities, like writing and submission of assignments, creating of academic blogs and discussions. With this platform students can also share information and develop wikis to promote knowledge development.

iv. Database Subscriptions

The librarians acknowledged that UWC library provides both print and electronic resources to cater for various needs of the users. Two librarians shared that UWC library is a member of the Cape Library Consortium (CALICO) and is working collaboratively with other CALICO members to pay for database subscriptions as a means to reduce the ever-increasing subscription costs. This allows continuity of access to online scholarly output from vendor databases which libraries are struggling to sustain.

Bandwidth has been acknowledged as an issue by most of the librarians and one librarian indicated that library users at UWC get preferential treatment from the campus ICT department and those accessing electronic resources get priority routing for fast accessibility to online resources.

v. National projects from which UWC library has directly benefited

Most librarians indicated lack of awareness of any other departments that are assisting UWC library with projects to bridge the digital divide. However, two librarians shed some light on other collaborative activities that are alleviating the divide. The library benefits from the projects implemented through the national licensing consortium that negotiates for low prices on electronic resources, thereby promoting continuity of access to online resources. Associations like LIASA, the International Federation of Library Associations and Institutions (IFLA) and others have been commended for constantly supporting the professional growth of librarians and enlightening them on how to progress, rechannel efforts and improve skills to meet the information needs of the digital age user. One interviewee noted that UWC library had resource digitisation support from Stellenbosch and Johannesburg universities as a means

to promote OA by sharing of scholarly content. This indicates collaboration among South African universities.

4.4 Summary

This chapter focused on the analysis and presentation of findings. Data collected yielded perceptions of the digital divide of selected UWC librarians and experiences of some of the postgraduate students (survey respondents) with the digital divide phenomenon at UWC. Themes were used to triangulate data from the online survey and interviews. The section also included the initiatives by UWC library to bridge the digital divide. The next chapter discusses the main findings, conclusions drawn and recommendations.

Chapter 5: Discussion of main findings, recommendations and conclusion

5.1 Introduction

The previous chapter focused on the analysis of collected data and the presentation of findings in various themes that were drawn from the research questions and from other aspects established from the collected data. The aim of this study was to determine efforts made by UWC library to bridge the digital divide and evaluate if these are perceived as effective by the selected user group. Sub-objectives were designed to unpack the main objective and to create research questions that guided the discussion. This chapter discusses the main findings in context of the reviewed literature, study objectives and theory that informed the study. Conclusions are drawn and recommendations are made based on this discussion.

The sub-objectives that guided the study were:

a. To determine the extent of and reasons for use of networked infrastructure by UWC Master's students in the library or on campus;

b. To determine if the UWC library e-services meet the needs of the Master's students;

c. To investigate programmes established by UWC library to promote the use of e-services by postgraduate students, and

d. To identify challenges associated with e-services available at UWC.

5.2 Discussion of findings

The discussion of findings relates to the objectives of the study and reviewed literature from the perspective of the theoretical paradigm, which in this case was Critical Theory. At the centre of Critical Theory lies the aspect of democracy and potential for emancipation (Cohen & Crabtree 2006; Budd, 2008: 176) and library technologies play a significant role in fulfilling the democratic roles of libraries (Pyati, 2007).

5.2.1 Use of networked infrastructure and internet access

Defining the digital divide concept in the context of South Africa, one librarian from UWC expressed that the divide is constituted by lack of access to ICT infrastructure and internet connectivity in many parts of the country. Survey responses show supporting evidence of 8%

of the lack of access to personal computers, and hence a 29.7% frequency in use of the networked infrastructure by users on UWC campus. It has also been established from the findings that a substantial majority (83%) of the sample use the electronic services offered by the library with a significant 40.5% using them at least 4 times a week. Thirteen percent of the users indicated that they use networked infrastructure in the library because they have no internet access at home, while 27% responses indicate use of the networked infrastructure because there is unlimited internet access on campus, which again supports the issue raised by some librarians that users cannot afford personal electronic resources and bandwidth. Therefore, both interviewees and survey respondents acknowledged lack of ICTs and the internet as influential factors in their experience of the digital divide.

Librarians noted the iPad and laptop loaning projects being implemented by UWC library to alleviate the students' lack of access to electronic devices. This supports the point highlighted by Daniels, Darch and de Jager (2010: 128) that some graduate students still depended on electronic devices loaned and used within library research designated space since they are from less privileged environments where computer workstations and internet resources are rare, and cannot afford to purchase personal laptops. However, efforts by these students to acquire personal laptops have been noted, which can allow them to take advantage of the free Wi-Fi hotspots on campus and resolve the challenge of expensive internet bandwidth. The availability of unlimited internet access seems to be of value to many users.

The notion of failing to afford electronic and internet bandwidth resources may be a reflection that UWC still attracts students from low income communities. This draws in aspects of critical theory, which requires the library to play an emancipatory role in providing ICTs to alleviate individual socio-economic experiences and declare information access a democratic right. This could also be a reflection of the impact of the socio-economic imbalances established in South Africa during apartheid still persisting in the post-liberation period. The efforts in South African universities, where some marginalised individuals have minimal or no exposure to networked infrastructure, demonstrate that academic libraries have assumed their roles as agents of democracy as they provide means to promote freedom of access to information.

5.2.2 Use of e-services

Electronic services promote users' interaction with a wide body of global knowledge and enable individuals to improve lives through knowledge sharing and collaboration with peers

online. Libraries therefore support less privileged communities socially and academically through the provision of internet-connected devices at the disposal of the user. The e-services offered by UWC library are frequently used by many users including those with personal laptops. Survey responses indicated that 40.5% of the sample use electronic services offered by the library at least four times per week. Most users expressed satisfaction with the library services, with 75% of users indicating that the services meet their expectations and 56.6% rated the performance of library services as good. The poor and satisfactory ratings of the library service performance by 2.8% and 27.8% respectively could be a reflection of other issues. These issues may include lack of adequate skills, because a response of 44.1% indicated that there are some electronic tools they cannot use and 8.8% of the responses indicated lack of confidence in finding information. Block (2010) identifies from various sources what constitutes the skills-related divide and the factors listed range from the inability to "use a mouse and typing, using word processing and spreadsheet programs, using e-mail, and locating information on web". Such challenges impact on the satisfaction of users' information needs since both "technical competences are required to exploit the ICTs fully" (Mossberger, Tolbert & Stansbury, 2003: 38).

The library is also engaging in services that accommodate users' personal cell phones into the academic arena. Using a cell phone or any other personal device to interact with content online, by scanning a matrix barcode, through emails or social media, can provide students with the freedom to work without being confined in the library building. Students may access databases remotely and access course materials, library guides and other MOOCs prepared for self-study in their personal space. Access to online education materials liberates the community by enabling the learners to develop socially and academically through virtual means.

5.2.3 Programmes to promote use of e-services at UWC

UWC Librarians noted the information literacy programmes, individual training sessions and research clinics implemented to promote better skills in using ICTs to access information. These programmes include training on general use of the computers in the Knowledge Commons, and training by librarians on the use of library services and reference management tools. One librarian indicated that UWC works collaboratively with other networks that bring together both historically white and non-white universities to establish an information literacy curriculum that supports lifelong learning. This is an indication of a balanced curriculum

different from that of South African colonial history, which had been designed to deliberately short-change non-white South African communities, leading them to graduate with inadequate skills (Mabokela & King, 2001). The broad curriculum also demonstrates a transformation and decolonisation of the curriculum history, hence the enhancement of education democracy and the building of an information society. Such changes demonstrate the democratic and emancipatory roles of library technologies highlighted by Pyati (2007), as the provision of ICTs, not only by UWC library but in every library, facilitates skills transfer that promotes exhaustive use of e-services and information-finding, and thus satisfaction of users' information needs. However, attendance of the available development (training) programmes depends entirely on an individual's effort and interest to learn.

Eight percent of the users indicated no interest in attending information literacy classes, even though they are aware of the availability of the classes on campus, and 11.8% of the responses indicated lack of awareness that the classes are offered. While some lack of interest in information literacy classes may be attributed to students regarding themselves as information literate, the responses of two librarians support the notion of the mental divide: the result of a negative attitude towards experimenting with electronic devices, or undermining services being offered. This mental divide could exacerbate the extent of the digital divide in academic institutions. This nature of the divide prevents individual growth and the exercising of the democratic right to access knowledge that satisfies diverse information needs, since it may be challenging to exhaustively manipulate the technologies available.

Some librarians noted language as a barrier, since English is a language widely used online, yet is not the first language for most South Africans and users from non-English speaking countries. English is also used as medium of instruction in South African universities, including UWC, and some librarians indicated that use of English has proven to be a challenge, particularly effecting postgraduate students, during training sessions and IL classes. It has been noted that these challenges may continue to exist if users have little interest or encounter barriers that hinder progress of the training sessions, thus confirming the argument by one librarian that the digital divide cannot be eradicated entirely.

5.2.4 Challenges associated with e-services

UWC library implemented various projects that network with other partners to keep abreast of emerging technologies and services suitable for the current digital environment. However,

there are some persistent challenges along the way and some of these are not peculiar to UWC. Fuchs and Horak (2008: 115) argue that there is a lack of economic and technological resources in Africa, which is a result of many years of colonial and post-colonial exploitation, exclusion, and dependency of the developing countries on developed nations. The librarians acknowledged that some of the users are from less privileged communities. Some of the librarians and users have noted that slow internet speed sometimes hinders access to e-services on campus. Literature attests that most academic institutions in Africa cannot afford high internet bandwidth since it is an expensive resource. In support of this, one librarian also noted that users may not have the financial resources to purchase data [bandwidth]. Pyati (2007) notes that the commercialisation of the internet and information exacerbates the socio-political problems of the modern society. In this post-apartheid era the UWC community still experiences moments when users can barely open an online resource due to lack of sustainable bandwidth. Pyati (2007: 39) highlighted the notion of a technocapitalist society: a new version of capitalism that privileges those who have access to advanced ICTs.

The UWC community is at a disadvantage during moments of extremely low internet speed because access to online information resources and other e-services is compromised. The situation of historically disadvantaged individuals and institutions after exposure to apartheid segregation, which impacted on the socio-economic status of some communities and generated the stigma of some races being inferior and followers in every aspect of life, may therefore not have improved relative to the gains made by previously privileged institutions. It has also been noted that in this post-apartheid period South Africa is still experiencing unequal distribution of income and educational resources, and high crime rates (Sehoole, 2005; Fuchs & Horak, 2008: 115), and this could explain some reasons for historically disadvantaged communities, and this particular academic institution, still struggling to afford sustainable bandwidth. The aspects noted above could also impact on individual ownership of electronic resources, since the socio-economically privileged individuals are more readily able to afford them. Users who are sufficiently fortunate to acquire personal technological devices at UWC may access free Wi-Fi on campus, although the Wi-Fi hotspots are said to be weaker than the networked infrastructure inside the library.

Security issues have been noted and these might threaten users and raise fears of losing personal belongings to burglars. Some librarians noted an incident in which the UWC library lost iPads to burglars and this confirms that crime rates in the post-apartheid South Africa may compromise users' efforts to acquire personal electronic devices, thus deepening the effects of

the divide. High crime rates may compromise individual efforts to acquire personal devices, thus increasing the number of users who depend on library infrastructure, and hardware acquisition projects might not be sustainable due to financial constraints. Security issues may therefore hinder the fulfilment of the democratic role that UWC library should play in improving access to electronic devices for marginalised users. However, UWC library has shown determination in fulfilling its role as an agent of social democracy by replacing the stolen iPads and introduced other skills programmes to support marginalised users with little or no exposure.

Electronic services include the provision of access to a wide base of scholarly content. This objective is difficult to achieve due to exponentially increasing database subscription fees to obtain access to peer-reviewed journal articles supplied by vendors. This was confirmed by the Department of Higher Education and Training of South Africa in 2014 when it tasked ASSAf to determine a way to alleviate libraries' subscription challenges by establishing a national site to allow access to high cost, commercial electronic full-text scientific research by local researchers (Keating, 2014), and this project in is progress. This indicates that South Africa acknowledges the inequities established in the past and the initiative of the national site would be a milestone in providing equal access to scientific research for local academics and researchers. The establishment of this site is a democratic task assigned to information service providers that ends the exclusion of scientists from previously disadvantaged universities, hence the dawn of a democratic initiative to end discrimination in South Africa. The site will also be a means to promote knowledge creation by diverse communities in South Africa.

5.3 Conclusions

In the light of the discussion of the main findings, the researcher has made the following conclusions:

- UWC library has persevered in acquiring emerging technologies and educational resources to promote the use of electronic services that meet users' needs, thus bridging the digital divide to a large extent for those without electronic devices and high internet bandwidth. The library has installed computers with internet connections, thus promoting the use of digital services, and lined up projects to loan electronic devices, which indicates a commitment to transformation that makes a library relevant in the 21st Century to benefit the digital age user. The supply of unlimited internet access and

Wi-Fi highlighted by users and librarians demonstrates that UWC libraries has placed itself well as an agent for democracy by making an effort to promote freedom of access to information by previously marginalised communities, thereby playing an emancipatory role. In 2008 South Africa's internet penetration was as low as 7,4% (Fuchs & Horak, 2008: 103), which indicates the scarcity of the resource, and hence an indication that the greater population does not have access to the internet. UWC may be experiencing low speed internet challenges, but it has the relative advantage of operating among the few internet-connected South African communities. As much as slow intent connectivity has been noted from the findings, it is valuable to note that there are other academic institutions in South Africa that have lower bandwidth than UWC.

- UWC library has established a culture of skills development in the form of information literacy classes and one-on-one training sessions, including research clinics, which are useful tools to research students. In so doing, UWC library has established the means to fulfil the democratic roles of library technologies, since the acquisition of adequate skills facilitates exhaustive utilisation of the services provided. The value of a service is recognised if users take full advantage of the provided package, an indication by 75% of the responses that the services provided by UWC library meet their expectations shows the extent to which users have benefitted from the e-services and skills training.

- UWC, though previously disadvantaged, is determined to transform its environment, but challenges will always emerge in every programme. One librarian acknowledged that it is difficult to exterminate the digital divide. Users with minimum information literacy skills and who have no interest in participating in library activities and training programmes contribute to the mental divide. The increasing high crime rates compromise the chances of eradicating the divide permanently. Contributing to these challenges are language barriers, socio-political status, commercialisation of the internet, and lack of awareness of the services being offered.

The discussion shows that UWC library is making efforts to bridge the digital divide by acquiring the necessary infrastructure and providing unlimited internet bandwidth. Users are satisfied with the e-services available and the library technologies have been of great value in fulfilling UWC library's democratic role through the provision of unlimited internet access. It has also been established that the digital divide is a common phenomenon that can be

experienced by several individuals at once, but the magnitude and nature of the divide may vary. Some UWC users note slow internet connections as a challenge, and others encounter the challenge of fully utilising e-services due to lack of skills to operate some of the tools that facilitate information access.

5.4 Recommendations

The discussion might have indicated that UWC library has an extreme challenge of slow internet speed, and it may be inferred that this is a common experience among the historically disadvantaged institutions. However it would be useful to engage into a further study to determine the impact that slow internet speed has on research production and also clarify if this aspect of the digital divide is an issue of concern only in historically non-white academic institutions of South Africa.

It should be noted that data collection for this study was undertaken before the student protest activity that took place in the latter part of 2015 at UWC and other campuses around the country. It would be valuable to consider the contribution of the digital divide to this phenomenon and the possible future impact of this protest activity on the digital divide, and the role that UWC libraries can play therein as an agent of democracy. A factor that should be considered in this is the recent prominence of social media as a supporting agent in democratic protest movements, and how e-services (in the form of access to infrastructure and networks, as well as Open Access) may influence or support such processes.

5.5 Summary and general conclusion

This chapter discussed the main findings of the study in relation to the reviewed literature and the theory that informed the study. Various aspects raised in the discussion led to the conclusions and recommendations presented. This study was grounded in a phenomenological qualitative research design coupled with Critical Theory to interrogate experiences and perceptions of users to evaluate and determine if e-services (including internet connected infrastructure) provided by UWC library are playing a role in bridging the digital divide.

This study shows that although the University of the Western Cape was among the historically disadvantaged universities of apartheid South Africa deprived of many technological and educational resources, its library has emerged as a competent academic library that prioritises

the provision of emerging technologies, skills development programmes and internet connection to bridge the major aspects of the digital divide. However, security issues, language barriers, the mental divide, and other emerging aspects of the digital divide may require unique strategies to constantly reduce the gaps that may impact on users' experiences and fully emancipate its users from the constraints of the digital divide.

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Appendices

Appendix A: A question guide for the survey on the digital divide experiences

I am a Master's student at the University of Cape Town, currently undertaking research towards my Master's in LIS in the Library and Information Studies Centre. The topic of my study is:

An evaluation of the electronic services to Master's Students by the University of the Western Cape academic library to bridge the Digital Divide.

The purpose of this study is to evaluate academic libraries' efforts to bridge the digital divide through electronic services.

The Digital Divide is commonly defined as the gap between those who have access to computers, internet and related skills, and those who do not.

Participation in this survey is voluntary and you may withdraw from this exercise at any point. All data collected will be used only for study purposes and will be useful to various academic institutions and libraries in Africa, since most of these are taking initiatives to bridge the digital divide in order to enhance human development. The responses for this survey will be kept confidential and anonymous.

Contact: Lena Nyahodza

Email: leenyahodza@gmail.com

Alternative Email: nyhlen001@myuct.ac.za

1. Your level of study

2. How frequently do you make use of the computer work stations in the UWC library space?

Never

Once a week

2-4 times a week

More than 4 times a week

3. If applicable, why do you choose to use the computer work stations on Campus? (You may select more than one option)

I do not have a personal computer

I do not have internet access at home/work

There is unlimited internet access on campus

There is direct access to the catalogue and databases

Other (please specify)

4. Do you experience any of the following challenges with workstations on campus? (You may select more than one option)

Workstations often out of service

Outdated software

Slow internet

Workstations are frequently occupied

Time stipulated for computer use is too short

I am not familiar with computers and computer programmes

Other (please specify)

5. How frequently do you use the e-services that support your research such as e-journals and eBooks with full text?

- Never
- Less than twice a week
- About 2 times a week
- At least 4 times a week

6. How would you rate performance of UWC library services?

- Exceptional
- Good
- Satisfactory
- Poor

7. How well are your information needs met by the UWC library service?

- Exceed expectations
- Meet expectations
- Do not meet the needs
- Other (please specify)

8. How would you rate your skills for finding and analysing, through the online library catalogue and databases, information that satisfies your research and learning needs?

- I am confident that I have the skills required to find and analyse information
- I am aware of some information tools I cannot use
- I am not confident at all

9. Would you consider taking information literacy classes offered by UWC library to improve your skills to use online services?

- I have attended the classes and I found them helpful
- I am considering taking the information literacy classes
- I know about the classes but I am not interest in attending
- I have never heard of the classes

10. What sources outside UWC library infrastructure do you use to access information relevant to your research?

Appendix B: Interview guide for the study on the digital divide

Background to the study

This is a survey to evaluate academic libraries' efforts to bridge the digital divide gap through electronic services. This research is a fulfilment of a Master's degree requirement for the Library and Information Science Centre at the University of Cape Town. This study is a general evaluation of the nature of the digital divide being experienced in academic libraries and the research is limited to one South African academic institution for feasibility purposes.

Research title:

An evaluation of the electronic services delivered to Masters Students by the University of the Western Cape academic library to bridge the Digital Divide

Research question:

How have the electronic services offered by the University of the Western Cape academic library been useful in bridging the digital divide?

Objectives of the study:

e. To determine the extent of and reasons for use of networked infrastructure by UWC Master's students in the library or on campus;

f. To determine if the UWC library e-services meet the needs of the Master's students;

g. To investigate programmes established by UWC library to promote the use of e-services by postgraduate students, and

h. To identify challenges associated with e-services available at UWC.

The interview questions below are aimed at engaging the UWC academic library management in a dialogue on the library's efforts and services rendered to Masters Students to bridge the digital divide and discussions on challenges they have encountered along the way.

Interviewees will voluntarily participate in this discussion and they have the freedom to withdraw from the discussion at any point. All the data collected will be kept confidential and used only for the purpose of academic research.

Name of Researcher: Lena Nyahodza
Contact: +27 73 9045 404
Email: nyhlen001@uct.ac.za
Alternative email: leenyahodza@gmail.com
Institution: University of Cape Town
Department: Library and Information Studies Centre

Interview questions

1. What is your perception of the digital divide?
2. To your own knowledge and understanding has UWC undertaken initiatives to bridge the digital divide?
3. What are some of the current initiatives to bridge the gaps?
4. What challenges are being encountered in an effort to deal with the digital divide legacy?
5. Do Masters' students fully utilize the e-services being offered by the library?
6. What are the major challenges faced by Masters' students when interacting with the networked infrastructure and e-services offered by the library?
7. Would you regard Masters' students skilled enough to find and analyse information that satisfies their information needs through the online catalogue and databases?
8. Are there programmes scheduled for Masters' students to improve their information literacy skills?
9. Are there national projects that UWC library has directly benefited from while bridging the digital divide, from government departments, NGOs or any other outside funding?

Appendix C: Interview consent form

An evaluation of the electronic services delivered to Masters Students by the University of the Western Cape academic library to bridge the Digital Divide

Library and Information Studies Centre
The Chancellor Oppenheimer Library
University of Cape Town
Private Bag X03
Rondebosch
7701
South Africa

Dear [UWC library Staff]

I am a postgraduate student at the University of Cape Town currently engaged in my research towards Master of Library and Information Science in the Department of Library and Information Studies. My research topic is: An evaluation of the electronic services delivered to Masters Students by the University of the Western Cape academic library to bridge the Digital Divide. I decided to interview a few identified UWC Libraries staff to obtain the data needed for my study. The participation for the various identified Libraries staff will be greatly appreciated.

The participants will be required to sign the consent form below as an agreement to grant me a recorded interview session with them. The names of the interviewees will be kept anonymous and all the data collected will be kept confidential. Participation is voluntary and you may discontinue at any point you of the interview if you see it necessary.

I ……., hereby give my consent to voluntarily participate in this study by fully responding to the interview questions from the researcher , Lena Nyahodza on …….. I have been fully informed on what the study is about and how the results of this interview will be handled. Data collected will be kept confidential and used only for study purposes. I am comfortable to make a contribution to this project and I know I can disengage from this exercise at any time.

Signature…….. Date……